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CAUTION TO THE PUBLIC;  
OR,  
H I N T S  
UPON THE  
NATURE OF SCARLET FEVER.  
DESIGNED TO SHEW,  
THAT  
THIS DISEASE  
ARISES  
FROM A PECULIAR AND ABSOLUTE  
V I R U S,  
*AND IS SPECIFICALLY INFECTIOUS*  
IN ITS MILDEST  
AS WELL AS  
IN ITS MOST MALIGNANT FORM;  
INCLUDING  
SOME CURSORY REMARKS  
UPON  
PLAGUE AND OTHER PESTILENTIAL DISEASES.

“ WHEREFORE LET HIM WHO THINKETH HE STANDETH, TAKE HEED LEST  
HE FALL.”—1 Cor. ch. x. verse 12.

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1831.

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TO

SIR ASTLEY COOPER, BART.,

*&c., &c., &c.*

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SIR,

*To you, from whom I have principally derived my professional education, I have ventured to dedicate the following pages ; especially, as their contents have been grounded upon those physiological principles, which were received from your instruction.*

*If, upon their perusal, you should be of the opinion, that I have made an unworthy application of those principles, the disgrace will be mine ;—should, however, you be inclined to think more favourably of the manner, in which they have been employed ; it is hoped, that you will accept this dedication, as a testimony of gratitude, and of regard, from one, who has the honor of signing himself*

AN OLD PUPIL.

Durham, September 28, 1831.



## CAUTION TO THE PUBLIC,

§c. §c.

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AS the contents of the following pages have been intended, more particularly, for the consideration of the public, and the non-professional reader, care has been taken that they should be written, in a familiar style, and as free from technicality, as the nature of the subject would admit. They have been expressly, though not exclusively, designed, for the benefit of the community, to institute an enquiry, upon a subject, the importance of which will be readily admitted, when its declared object is the preservation of health, and not for the purposes of medical, or physiological, discussion. It would have conveyed the appearance of presumption, in the present advanced state of medical knowledge, to have submitted, to the attention of my professional brethren, any remarks, in the form of a didactic treatise, upon a disease, the nature, and symptoms of which, have been so minutely, and accurately defined, by many authors in our own country, and its general treatment so well understood ; yet, it is possible that the junior members of the healing art may glean some scattered hints from the perusal, which may not prove unprofitable to them in practice ; while the more experienced practitioner, it is sanguinely

hoped, will not be prone to mark or condemn any thing in a discussion, which has for its object, the general welfare, merely because it conveys to him no new information.

In the prosecution of this inquiry hypothetical opinions will be studiously avoided, and it will be the chief endeavour of the writer to deduce from indisputable, and acknowledged, facts the theory which it is hoped will ultimately be established.

When the history of the disease in question becomes broken and unconnected, when its morbid operations within the human frame elude our research and observation, or its peculiar phenomena are too intricate for human comprehension, our further inquiry will be closed ; we will then rely upon those characteristic proofs which experience has confirmed.

In proceeding to speak briefly of the subjects indicated in the title page, it is by no means intended to entangle either my readers, or myself, in the labyrinth of medical, or physiological, theories, neither shall I enter into doubtful questions, or dwell long upon those inexplicable phenomena, which occasionally appear in this, as well as, in most other, specific maladies, and which force themselves, more especially, upon our notice in the usual course, and progress, of Scarlet Fever. In vainly trying to comprehend why one individual in a family should be singled out, as the victim of an epidemic, and its remaining members, apparently equally susceptible of infection, should be spared, we disclose a presumptuous propensity to detect, and solve, what is beyond the reach of human discernment.



In availing ourselves of those visible, and uniform, signs which accompany, and mark, the ordinary indications of specific disease, we possess the surest, and best, guides in detecting its presence, in ascertaining its nature, and in guarding against its propagation. In collecting irregular, and uncertain, symptoms, to which no interest, or importance, can be attached, and from which no knowledge, can be acquired, would tend to accumulate confused, and, in many instances, discordant, evidence, that would serve no other purpose, than to unsettle those inductions, which had been drawn from a connected series of facts. But, in discussing this subject, I by no means wish to be understood as delivering, and relying upon, opinions that have solely been the result of my private experience, although I can have little hesitation in pronouncing my sentiments upon it with the conviction of certainty, which has been corroborated by the concurring testimony of ancient as well as modern authors.

The present subject would have been entered upon with little, if any, expectation of success, had the opinions here entertained been at variance with the generality of those practitioners, who have preceded me in the same path, and whose extensive experience necessarily held them up as safe examples, and guides.

It has been remarked, that mankind will often resist the influence of arguments taken separately, while they readily yield to the impression made by the weight of a united, and cumulative, force : I therefore feel that I should neither consult the interest of the public, nor do justice to the opinions of others, nor

to my own, if I neglected to urge in their favour the experience, and testimonies, which led to their adoption.

To accomplish the point in question, with any probability of success, it will be my first object, after a few cursory observations, to attempt to shew that the disease, more immediately under consideration, arises from an absolute and specific Poison; and then, to direct the attention to an historical narrative of the progress of Scarlet Fever, and of the variety of denominations, under which it has been described, from a very early period, to the present time; and lastly, in the form of a conclusion, to throw together, as far as our limits will allow, its leading symptoms, and treatment, in a popular form, in order that the public may better understand its nature, and general character.

The testimony of ancient and modern writers upon the question, now before us, will be found too clear, to be either misunderstood or misinterpreted; for, by whatever name this disease has been designated, it will be admitted, after a careful, and unprejudiced, examination, that the same infectious malady has formed the subject of their several descriptions, and their identity with Scarlet Fever thus becomes clearly made out, and established. An apparent discrepancy may exist in the accounts given, by the ancients and moderns upon this disease, yet when it is recollected, that the former generally employed such morbid denominations as were significant of its most formidable, and fatal, symptoms, paying less attention to external signs, and varieties, it will be readily understood why

so many, and varied, names should have been assigned to one, and the same, malady. It will, however, be found in the sequel, that a greater similitude has been preserved between the several names employed, than can be discovered in any other disease, the nature of which is so specifically infectious, and dangerous. It may here be stated, with considerable confidence, that, however great the number, and variety, of titles this disease has at various times and through successive periods, received, infection was invariably implied in each. Anti-contagionists are of modern growth as regards Scarlet Fever in its mildest form ; these theorists originally confined their speculations more particularly to the Plague, and other pestilential disorders ; there is, however, reason to believe, that their delusions have reached, unintentionally, beyond those disorders, and that their influence has tended to unsettle and pervert the opinions of the public, upon infectious, and epidemical diseases, in general, engendering doubts of their incommunicability, and propagation, through the medium of the air, as well as by human means.—See *Appendix, No. 1.*

But mankind, it has been remarked, have hitherto had a wonderful tendency to rush into extremes, and in no instance, perhaps, is this fact more fully exemplified than in the immediate subject before us. For although the common experience of ages, and the concurrent testimony of the best professional authority, coincide, more or less, in attesting the fact, that each variety of Scarlet Fever, under whatever form it has appeared, or by whatever name it has been called, originates from, and imparts, the same specific,



Poison ; yet, in contradiction to universal consent, an opinion very commonly prevails, amongst the different classes of society in this country, that the term *Scarlatina* implies so modified, and subdued, an affection as to be disarmed of its specific virulence, and capable only of propagating a mild, and harmless, variety, consequently not liable to degenerate into, or impart, that form of the disease, which is accompanied with an ulcerated, and malignant, sore-throat—happy would it have been for society had this opinion been established in truth !

It will ultimately appear that *Scarlatina* was merely introduced to express the specific, and characteristic, efflorescence of this fever ; which is sometimes unattended, though often accompanied, with malignant, and ulcerated, sore-throat ; and has since been employed by practitioners as a generic name for Scarlet Fever. Fatal experience has too frequently proved, that when this disease spreads widely as an epidemic, it exhibits, in the different persons infected, every gradation of character, from the slightest, to the most malignant.—*See Appendix, No. 2.*

It has been said in great earnestness and truth, by a distinguished writer, that it is singular that the slightest of all eruptive fevers, and the most fatal disease known in this country, should rank together, and spring from the same origin ; for experience decides, that Scarlet Fever, the malignant scarlet ulcerated sore-throat, are merely varieties of the same disease.—*See Appendix, No. 3.*

In each variety which has been described as existing in different parts of the world, their specific nature



and infection cannot be considered in any other light, than identical, whether they be derived directly from epidemical, or from human effluvia; hence it is reasonable to conclude that they originate from one primordial Poison, and retain the same particular character—their apparent, differences, and varieties, arising from adventitious circumstances, that may be imputed to season, climate, &c., to peculiarities of constitution, or to particular conditions of the health, of the persons upon whom they appear.

In pursuing this enquiry, it is hoped that evidence, sufficiently convincing, may be produced to satisfy the most incredulous, that *Scarlatina* was originally employed as a term in the sense just stated—not, however, to the exclusion of infection.

During this examination, it will be apparent, that the mind of the public has completely departed from the original, and scientific, application of this term, which had exclusively, and distinctly, implied an infectious disease, in its full, and comprehensive, meaning.

It would be unnecessary to pursue this point any further, at present; I shall, therefore, content myself with intreating the reader to divest himself of this erroneous impression, that it may not influence his judgment, inducing him to view *Scarlatina* in its mildest form, as independent of specific infection.

As the misapplication of this term has been productive of serious evils, in a public, as well as in a professional, point of view, it becomes a consideration of primary importance to meet, and remove, the error; for while such mistaken notions are en-

tertained, respecting an insidious, and pestilential, disorder, it cannot be a matter of surprise to find, that during the prevalence of Scarlatina, as an epidemic, it should be prolonged, and propagated, for want of that necessary precaution, which should be observed, not merely during, but for some time after, the course of its mildest, as well as its most malignant form.

Should the speculative opinions, which pervade the public mind, influence, in any degree, that of the profession (and it is to be feared that there is still considerable discrepancy between some of its members, upon the subject of infection in general), it is yet more desirable that the subject, which is exclusively the cause of these pages, should be brought forward for examination in such a familiar shape, as may afford the most favorable opportunity for forming a definite opinion upon it, in the hope of bringing the question to some degree of certainty, under the conviction, that errors in theory have a natural tendency to errors in practice.

It cannot be matter of indifference to any person, however insulated his lot may be in society, and however confident he may feel in the physical strength of his body; to which he may have hitherto attributed his insusceptibility of infection, whether the opinions he holds, respecting the nature of Scarlet Fever, or any other pestilential disorder, be correct, or erroneous, well knowing that, during their prevalence as epidemics, they may be said to be about his path, and about his bed.

Though this disease more rarely attacks adults, yet

fatal experience gives proof of their liability and insecurity.

While we are obliged to acknowledge our utter ignorance of the nature of those laws, by which a pestilence pounces upon mankind, scourging one place, and sparing another, selecting one person, and passing by another, yet we cannot attribute these fearful phenomena to blind chance, or accident; but feel compelled to recognise the same power that created, still governing, and directing its course, by natural and secondary means.—*See Appendix, No. 4.*

As experience instructs us, that no age is exempt from the influence of Scarlatina, though the young and delicate are more commonly its victims, no one should presume upon his security during its prevalence; unless he has been the subject of its influence, or while, indeed, there is a probability of its being propagated by human infection.

The reader may be inclined to consider that the views here given, and the caution recommended, are exaggerated, and unnecessary, and that their general colouring is too strong and sombre,—if such should be his impression, the writer begs it to be distinctly understood, that this sketch is from nature, and that it is contrary to his intention to assume the character of an alarmist; yet, considering it right that some effort should be made to place the subject under consideration in its true light, in lieu of a more efficient and influential monitor, he has stepped forward to raise a warning, though feeble voice, in the hope of rousing the public mind from that apathy, and indifference, to topics of this nature,



into which it has, by some strange infatuation, been plunged.

Should the evidence advanced be so far convincing, as to turn the erring stream of popular opinion, as far as regards the present subject, into its right course, the propagation of Scarlet Fever, and its fatal ravages, may be materially diminished, by pointing out the necessity of imposing a more circumspect and rigid restriction upon that intercourse, which has been too promiscuous, and unrestrained, during its prevalence, among the several ranks of society in this country.

By the preceding, or any subsequent, observations, I would by no means wish it to be understood, that I entertain the opinion that specific, and pestilential disease can be banished from this, or any other country, by human agency; although it may appear in the sequel, that Scarlet Fever is an exotic, and not of indigenous growth. It would be inconsistent with reason, and our better faith, to entertain the presumptuous idea, that man can stand between the dead and the living—that he can stay a plague, or shield from a pestilential visitation any people, or nation. Still we indulge a belief, and persuasion that, when dangers, and calamities threaten, it is the duty of individuals, and of nations collectively, to exercise every justifiable means for their own, and for the public security.

To illustrate the benefits arising from vigilance, and precaution, and to shew the difference between the Europeans, and Mahometans, during the prevalence of the Plague, the reader will find, in the Ap-

pendix, an interesting and instructive extract, from a work of considerable renown upon this disease.—*See Appendix, No. 5.*

If such means prove in most instances all-sufficient to ensure safety against the subtle, and active venom of the most fearful of all human maladies, may it not be reasonable to anticipate as favourable a result by adopting a similar precaution, during the existence of Scarlatina. It becomes us not to reject the lesson afforded by this narrative; on the contrary, let us take and maintain our stand on this plain, and instructive fact, and apply, not with a too presumptuous confidence, the accredited means we possess, when a plague exists, or pestilence over-shadows our land. It speaks too plainly, to require any further comment; the evidence afforded is equally strong, and unequivocal, and must, with every unprejudiced mind, set at rest the question respecting the *advantage of seclusion, during the prevalence of a pestilential Epidemic*, and, at the same time, reflect some light upon its mysterious nature and influence.—*See Appendix, No. 6.*

But the anti-contagionist questions, nay denies, the doctrine of infection in Plague, and avers, that this pestilence is incapable of being communicated from one individual to another; while others doubt its existence as an epidemic, and its being propagated by inoculation.

It would have remained an insurmountable task for the public, who must, at all times, be supposed to feel a deep interest in subjects of this nature, to have arrived at any satisfactory conclusion, or to have de-

cided between the contending parties, had not the result of the rash experiments of these infatuated, yet honest, speculatists, put the question for ever at rest, as far as regards infection, and inoculation : the contagionists themselves could scarcely have desired stronger or more convincing proofs, of the correctness of their doctrine respecting the nature of Plague, and its propagation, than were afforded by the very tests that were expressly instituted to establish the contrary doctrines. For we learn that these daring, though sincere, experimentalists, both reaped the bitter fruits of their own rashness ; the one, in consequence of exposing himself for some time among the infectious air of a pest-house in Constantinople, the other, from inoculating himself with the poison of Plague.—*See Appendix, No. 7.*

The reader's attention would not have been occupied so long upon the differences of opinion upon this disease, did they not vitally concern the question of infection in general, and of absolute, and specific poisons—topics of importance abstractedly, and which may ultimately tend to illustrate the doctrine, which the writer is desirous of inculcating in these pages, touching the specific quality of each variety of Scarlet Fever.

As it would be foreign to my present purpose to pursue this topic, and unnecessary to enter into further detail on a matter which will be found so fully, and ably, though variously discussed, in the works professedly written upon this subject, and to which allusion has been made, and which will be found specified in the Appendix, I shall, therefore, briefly re-



mark, that, though it would be in vain to look for any satisfactory result, by indulging in speculation, and theory upon those existing phenomena, the nature of which is too inscrutable for human perception ; yet that it may be within the province of observation, assisted by analogy, to afford some glimpse of the quality, and operations, of the different species of poisons, whether they be morbid, or derived from the animal, vegetable, or mineral kingdoms.

It must be here observed, that the principal sources of knowledge are derived, generally speaking, from a few plain and well ascertained facts ; these must always be considered as the tests and criteria, on which dependence can, confidently, be placed, and to which reference can be made, whatever be the question under discussion.

It would be difficult to point out a subject, in the department of Science, or in the whole range of Natural History, more abstruse than that which includes Poisons. This difficulty, it may be presumed, consists in the subtilty of the primary essence of each species, the tenuity of which eludes our senses, whatever body, or form, of matter it assumes—whether it be suspended in the atmosphere, or enveloped in animal secretion—whether it exist in the sap of vegetables, or within the condensed texture of metallic ore.

It cannot otherwise be expected, than that, which relates to the economy of poisons, should contain some points remote from our analogies, as well as, from the comprehension of the human mind, which acquires all its ideas from sense, and experience. Many of the phenomena of morbid poisons, it will be found, have

no parallel. Yet these, as well as others, which are so constantly presenting themselves to our notice, among the innumerable works of creation, suggest, and enforce the belief, that subtile, and invisible, essences may, and do, exist, in other bodies of a gross, and corrupt, nature, with which they are clothed, and in which they have their being, adapting them to the variety of objects with which they may be surrounded, and to the ends for which they were created.

Analogy does not compel us to reject the idea, that a particle of matter, minuter than all conceivable dimensions, and transparent withal, may just as easily be the seed, or essence, of poisons, as that which constitutes the mere essence of scent. If we were to reject such inferences, we might refuse granting assent to the existence of any particle of matter, or agency, that was impalpable, or imperceptible. It is only what is true of the most important and awful agencies, and operations—for the great powers of nature are all invisible, and depend upon substances, and actions, which are totally concealed from our senses.—*See Appendix, No. 8.*

In contemplating these phenomena, we are enabled distinctly to comprehend, that a provision has been made, which has been left to act according to laws, which, forming part of a more general and relative system, regulate this particular system, in common with many others observable in the works of nature. To ascertain the several natures of morbid poisons, the aid of pneumatic, and animal chemistry, has been called in; yet their several processes of analysis have been employed in vain. They have hitherto eluded



the researches of the Physiologist, as well as of the Chemist ; their species are only known by the uniform influence which each exerts upon the frame of man, and animals. Their effects are found to vary, not only according to the state and condition of the animal functions, but, even according to the organs upon which they operate.—*See Appendix, No. 9.*

Some Poisons act upon the nerves exclusively, as well as primarily—others, upon the blood vessels, and absorbents—some produce instantaneous death, without any evident lesion of the human frame—while others are slower in their fatal influence—the operation of some depends solely upon their specific quality—while that of others relies upon quantity. Many of the specific morbid poisons observe a limited—others an indefinite and critical course ; the former, with a few exceptions, are incapable of acting upon the human body a second time ; having rendered it insusceptible by the first pestilential taint. Many other phenomena are recognised during the operation of different poisons upon the human frame—sufficient, however, it is hoped, have been given in this cursory enumeration of them, to convince the reader that, although each species may be ascertained from the result of their uniform action, yet, that our acquaintance with the precise quality of these, can only be acquired by means of observation, and experiment ; remembering always, that in these instances, it is the specific result that becomes the object of contemplation.

From this brief mention of some of the leading phenomena of poisons, which are displayed during

their several operations upon the animal economy, more especially those which have been denominated morbid, it may readily be seen how easily a speculative mind might be seduced from the sober path of observation, and experience, by their novelty, and variety, to wander into the mazes of conjecture. To these causes may be principally attributed the visionary, and contradictory opinions, respecting Plague, and other pestilential diseases which depend upon a specific poison; and I am inclined to believe, that Scarlet Fever has not escaped their influence, and that it has experienced, in a scientific, and practical, point of view, very considerably, the innovating effects of speculation; for it cannot be concealed, that the science of Medicine is not without its free-thinkers.

As many of the preceding remarks will be found, it is hoped, directly applicable to the several morbid peculiarities that are observable in, and characteristic of, Scarlet Fever, and as it is intended to employ the test of experience and observation, as the touchstone in the ultimate examination of this disease, the digression which has been made, may have a greater claim upon the reader's indulgence; for it cannot be doubted that considerable interest has been excited, by these public discussions, respecting contagious and infectious diseases: and when it is recollected with what ardour every new doctrine is listened to, and with what avidity it is seized, and adopted, especially if its ultimate, or even temporary, popularity should tend to the discredit, or overthrow, of any ancient, and long-established opinion, or system, it cannot occasion surprize, if even the insulated science of



medicine should be subject to the like innovation and danger. For, although, (agreeable to the present state of physiology, and our acquaintance with natural history) the functions of the human body, and the specific quality of morbid poisons, may be considered as being controlled by fixed and immutable laws; yet there are some who not only secede from such generally acknowledged principles, but are zealous in endeavouring to establish a belief, that such mutation, and variety, may be affected by chance, time, or adventitious agencies, as to render the present system of physiology, and of disease, more or less a dead-letter, and their records a sealed volume in each succeeding age. Such persons cannot be convinced, that the real essences of these several poisons are utterly inseparable from their own peculiar forms of matter, or that they retain their characteristic and primary qualities, under every external circumstance, to which they may be exposed.

In returning to the subject, more immediately before us, it will be necessary to consider what is the precise acceptation of certain technical terms employed in these pages. The expression, *morbid poisons* has already been used; it may not, however, be amiss, in this place, to explain its professional meaning.

Although Poisons are generally defined to be those substances, which, in small quantities, produce deleterious effects, on the human body, yet several of these will be found to constitute some of our most beneficial and powerful remedies—this is more particularly true of mercury and arsenic. There are

many sources from which they are derived ; but as our present business is to explain the influences of those denominated morbid, our attention will be confined to their phenomena.

In offering a definition of these subtile and pestilential agents, they may be said to possess the power of exciting unhealthy, and injurious, actions, when applied to the human body. These influences are found to vary according to the *specific quality* of each, as well as to the nature, and functions, of those organs, and surfaces, which they may primarily infect. Some produce constitutional, and others, local effects ; among the former, considerable, and marked, differences occur ; *those, that propagate their species, accomplish it by means of the animal process of secretion—such are infectious—may exist as Epidemics, and are liable to have their virulent essence transported by various articles of merchandise—a few, of these, form exceptions to this rule ; while others of the same class excite, merely, specific, and morbid, actions, which do not terminate in any perceptible secretion, and may generally be considered, not infectious, as some of these are not supposed to propagate their kind—these have received the name of Endemics ; while those that are local, propagate their species, by contact, and are consequently called contagious.*

It may be added, that although in the animal, and vegetable, as well as in the mineral, and chemical poisons, the effects upon the human frame are generally proportioned to the quantity of poison, it is not so *with the morbid ; for no particular influence is ma-*

*nifested, whether the quantity inserted be large or small, whether the matter employed be taken from a patient having a mild, severe, or malignant, disease. Its effects depend upon the state of the constitution, at the time the poison is introduced: its action is modified by the peculiar condition of the patient, and not by the quantity of the poison.—See Appendix, No. 10.*

*The quality of morbid poisons may be said to be definite, and indivisible, admitting of no degrees, or gradations, exclusively implying peculiar efficacy, each species depending upon its own virulent essence, which is identified with its specific quality.*

It has been delivered, as a general maxim, that *primary qualities, in any body or form of matter in whatever state it may be, are such as are utterly inseparable from such body, or form, of matter, such being retained under all the alterations, and changes, the body, or form, of matter, may itself suffer, as all the force, that can be used upon it, avails nothing.—See Appendix, No. 11.*

If this maxim be applicable to the constitution of morbid poisons, it seems reasonable to infer that their primary qualities are so identified and inseparably united with their essential rudiment, as to admit of each species being distinguished by that measure, and boundary, whereby it is constituted that particular species, and distinguished from others.

Taking this view of the question of primary quality, it may be inferred, that the real essence of morbid poisons is indivisible, and immutable. By this indissoluble bond, and empowered by such properties of specific excitation, identified with its qua-



lity, permanency of morbid species becomes secured ; the virulent essence of each is thus exempt from the influences of fortuitous, and adventitious, agencies, whether arising from within, or from without ; and pursues its own course, and preserves its specific nature, from one generation to another, without mutation, or alloy.

Modified, or subordinate, quality, of the poison of Small Pox, has been assumed as the sole cause of those milder forms of that disease, which occur, after inoculation, and vaccination ; however, as matter taken from patients, after these operations, is not found to reproduce matter of a permanently modified kind, (independent of what has just been said respecting specific quality,) they can only be considered as temporary phenomena, not relating to the condition of the poison, but to the state, of the human frame ; for it should never be lost sight of, in enquiries of this nature, that specific quality, in every morbid poison, exclusively excites specific action, and is subject to no change itself.—*See Appendix, No. 12.*

Charged with these properties, they are capable of converting a healthy, into an unhealthy, process, by exciting *specific inflammation*, when ever the morbid poison should be applied to a secreting surface, and which terminates in the propagation of similar matter. *Simple action, or inflammation, as opposed to specific, it may here be observed, implies a healthy secretion, possessing no peculiar properties.*

It now remains, that I should attempt to define the terms *Epidemic, and Endemic ; Contagion, and Infection.*

Although custom may be allowed to exercise a considerable influence, in our decision upon the import of these ; yet it cannot be admitted to such an extent, as to do violence to their critical import and application.

*Epidemic* implies a disease, not peculiar to a nation, or people—which appears, and sojourns, as a stranger—uncertain in its visitations—and observing no stated times in its reappearance, or regularity in its continuance ; Plague, and Scarlatina, may be adduced in illustration of *Epidemic*, whereas *Endemic* implies a distemper, which arises from some circumstances, peculiar to a country—of which *Intermittents*, arising from the marshes, and fens of Essex, Cambridgeshire, &c. are examples.

The terms *Contagion*, and *Infection*, professional men, as well as the public, have been in the habit of employing as synonymous ; and if it were not for the purpose of contra-distinction, these might be used, arbitrarily, to express the same meaning. *Infection*, it is generally admitted, implies contact ; it necessarily supposes touch, upon the principle that nothing in the material world can act in any other manner—*Contagion* in like manner implies *Infection*, whether this term be used to designate the influential effects of a disease, that is communicable through the medium of the air, or one, which can only be imparted, by means of actual insertion, or touch—all the specific affections of the skin exemplify the latter—and Small Pox furnishes an instance of the former. Hence it may be inferred, that the term *Infection* might, with practical benefit, be restricted to those diseases, which



are communicable through the atmosphere; while that of *Contagion* might be limited to those, which can only be conveyed by actual contact, or insertion.

It may, however, be asserted, with considerable confidence, that all diseases which possess the power of being propagated, under certain circumstances, from the diseased to the healthy, are infectious—whether the matter, which appears to be the immediate means of propagation, be communicable by specific poison directly passing from person, to person, or attributable to that of an existing Epidemic—or whether, through the medium of the atmosphere alone, as in Hooping Cough—it may operate in both these ways, as in Small Pox. As Cow Pock, and Hydrophobia, can only be communicated by absolute insertion, the term contagion might, with more propriety, be applicable to them.

The atmosphere, while an Epidemic prevails, it must be remembered, can in no other way be conducive to disease, than in receiving, and transmitting, a taint from some specific poison, by which the existence of any particular malady has from the first been occasioned; the varieties observable in such disease, depend upon *peculiarities* of constitution, which may be induced by climate, season, &c., as well as various conditions of its own.

That pestilential maladies do, *apparently, become modified*, has been universally observed; a striking illustration of which will be found in the inoculated Small Pox—see *Appendix, No. 12*—yet, the specific quality of the matter in each variety remains unaltered. No permanent change can be effected, if we



may judge from observation, and experiment, as the matter, taken from a patient who has had Small Pox mildly, will produce in others every variety from the mildest, to the most severe. Indeed, it appears as unreasonable, and inconsistent with the course of nature, to believe, that Plague, or any specific disease, would lose its primary qualities, as that the “Æthiopian would change his skin, or the Leopard, his spots.”

I am well aware, that in declaring my own opinion upon the immutable nature of specific disease, I am disclosing sentiments more, or less, in opposition to the prevailing notions of the present day; I trust, however, that the reader will listen to me with that candour, and indulgence, which it is presumed may at all times be granted, when the object of inquiry is truth, and utility. It is possible, that the means pursued, and the evidence advanced, may not appear as clear, and convincing to him, as they have to my own mind. This, it may be observed, may depend, in a great degree, upon the different notions which are entertained upon the value, and nature, of evidence, and which arises from a principle that results, from our various habits of thinking, and from our modes of reasoning.

In estimating the value of testimony, we should consider the nature of the subject to which it is applied; and we are, in many instances, compelled to remain satisfied with the best evidence we can obtain concerning it.

In the absence of such proofs, as might be required by a mathematician, I shall endeavour to arrive

at an approximation to the truth, by the best evidence, I can collect, and that is to be found in the range of probability ; and as just conclusions can only be drawn from accurate observation, the following, which are brought forward, may, in some degree, be considered to justify the opinion, here entertained, and ultimately tend to convince others of the reasonableness of the theory, that has been adduced.

## REMARKS

### UPON THE SPECIFIC QUALITY OF THE VIRUS OF SCARLET FEVER, &c. &c.

Presuming that certain specific diseases were imposed, upon mankind, for purposes subservient to their present condition ; it would be difficult to point out, or select, any instance, in the whole range of nature, that furnishes such a proof of that fitness, which subsists between inanimate, and animate bodies, as is exemplified in the relation, which the pestilential essence of morbid poisons bears to the human frame ; so close, and intimate, is this aptitude, that the very preservation of those, that possess powers of propagating their own species, is consigned to it—these have been considered as forming a distinct class, in reference solely to man.—*See Appendix, No. 13.*

Hence they have been distinguished by the epithet human ; no other animal (with few exceptions) being subject to the influence of those, which excite infectious diseases. And although it would be impracticable to discover the precise point of time, or the

particular occasion, on which the introduction of these pestilential agencies occurred; yet the general result of historical enquiry points to Egypt, as the earliest, or original, seat of most of them.—*See Appendix, No. 14.* In that hot-bed of corruption, they are first met with, and while we learn, from unerring authority, the design of those, which we know from experience are the most noisome and pestilential, we discover, at the same time, the power that caused and directed them.

The preceding presumption carries with it a greater degree of probability, when it is recollected, that there are sufficient reasons for believing, that specific diseases were not primordial, or innate, evils, to which man was naturally, or necessarily, heir. These have been superadded to his condition, and have been employed, upon various occasions, as punishments, and warnings, in the earliest ages of the postdiluvian world, as well as, through successive periods, to the present time: and, if the physical world be so governed as to be subservient to the moral, which it probably is, where can material instruments be found, better calculated to call a people, or nation, back to a better state of mind, or to sober them in the midst of their delirious and dangerous follies; or to impress upon them the conviction, to use the language of an able writer, that they are mere mortal, than plagues and pestilential disorders?

It would be repugnant to reason, and contradictory to experience, to believe, that such efficient, and, on many occasions, significant, though noisome, agencies, could have been the offspring of chance; or would



have been entrusted to precarious, and fortuitous, influences. That this, however, is not their condition, may probably appear in the sequel of this enquiry; their adaptation to the laws, and functions, of the animal economy—their propagation being, uniformly, and specifically, accomplished by a vital, and involuntary, process, (thus placing them entirely beyond the reach of human control) are circumstances, which increase the probability of their being the works of design, and contrivance, and consequently imply that the same creative power, that brought them into existence, still controls, and directs, their course.

As the principal design of these pages is to shew, that the poison that causes the disease, denominated Scarlet Fever, was of a peculiar, and fixed nature, preserving its specific qualities, under all its morbid varieties, it has been thought desirable to have recourse to analogy, to assist in the solution of those subtile phenomena which characterise its leading, and its most prominent, features.

The employment of arguments, derived from this principle, in reference to subjects that do not admit of direct proof, has been frequently adopted for the purposes of illustration in physiology, as well as in other departments of natural history. They are essentially serviceable in assisting our researches, when presumptive evidence can only be obtained—by throwing light upon subtile and obscure agencies—by affording comparative observations, and ultimately establishing a test, by which a judgment may be formed of the particular point of enquiry. By adopting this mode of proceeding, we may be said to stand upon firmer

ground, than if we were to adopt any other line of reasoning.

The varied, and numerous, phenomena, which are manifested, during the operation of these morbid agencies, were formerly attributed to the *immediate absorption of the identical particle of poison*, by which the constitutional, or local, infection had been occasioned. This doctrine has been long since exploded; experiment, and experience, having shewn, that these morbid effects cannot be produced without the intervention of the process of secretion, by which a *new fluid* is generated, and *which* becomes afterwards absorbed.

Morbid poisons have the specific property of exciting a series of actions, that terminate in the deposition of a peculiar fluid, which, being absorbed, is capable of infecting the individual, in whom it is produced, directly by such absorption, and of infecting any other individual indirectly—namely, by a repetition of the same series of specific actions. By this process, the distinct, and fixed, character, of each specific, and infectious, disease, becomes perpetuated, and its species distinguished; and so infinite are the varieties in each species, that some have been inclined to attribute these to *a modification, and altered state, of the quality of each poison*; but as these varieties are not native, or congenital, and are not propagated by generation, they cannot be converted into permanent species. Such diversities may be referred to various predisposing conditions of the animal frame, and not to any change in their own essential qualities. These

occurrences, to which numerous others might be added, apparently, indicating deviation from species, are too superficial, and evanescent, to constitute a distinction; and are, altogether, insufficient to establish a modification, or diversity, in the species of any morbid poisons.

Specific diseases are characterised by fixed, and definite, external forms; these being uniformly observed attendant upon their constitutional, and local existence, afford the tests, and criterea, of distinct species; which, being transmitted, and perpetuated, by means of the human frame, warrant the inference, that the specific, and primary, quality of each, is fixed, and immutable—specific quality being as indivisible; as the laws of animal life are unalterable.

If this be admitted, the character, and species, of each morbid poison, may be ascertained, and determined, by the phenomena they exhibit—such being the legitimate, and uniform results, of specific regeneration. These attend the reproduction of species, throughout all the works of creation, and necessarily imply a distinct quality; which is strikingly exemplified in the regularity, which is observable in the excitation, and reproduction, of each morbid poison.

In whatever point of view this interesting subject is contemplated, we shall be inclined to consider that each species is controlled, and preserved, by such laws, and provisions, as preclude the possibility of change, and, at the same time, secure those peculiar features, which constitute the distinguishing character, and nature, of each. It may be advanced, as an acknowledged axiom, in whatever instances it may be



found among the works of nature, that the identity, which subsists between the off-spring and the parent, is an incontestible evidence of specific generation.

In contemplating the numerous diseases, which are considered to arise from specific poisons, we shall witness some which differ widely in their character ; while others exhibit, and preserve, a close resemblance—yet these will be found to be distinct in their several natures.

By induction from such facts, as pass under our observation, we may ultimately arrive at conclusions, more consistent with the nature of the disease in question, and be better qualified to estimate its mode of operation upon the human frame. Although we may be acquainted with the structure, and functions, of the medium, through which morbid poisons operate ; it is only by the effects, which we observe to be produced, that we can form any just determination of the quality of any particular poison, and of its action upon the animal economy. We are not sufficiently acquainted with their nature, to be able intuitively to say, what will be their specific workings, neither will a knowledge of their sensible qualities, without the aid of analogy, in every instance, afford us precise information.

The individuals of this morbid class will be found to produce injurious effects, by diminishing, for a time, the powers of life. Many of these operate in various ways, according to their several natures, the mode of application, and the state of the body upon which they act—others excite general, while some produce local, action. We must conclude, therefore,

that their qualities, and mode of operation, materially differ. In this class of agencies, we comprehend the various species of infection, as of Small Pox, Measles, Marsh Miasmata, Plague, Scarlet Fever, &c. It must be admitted, that very material varieties are observed in the operation of these. The contagion of Small Pox, for example, excites an increased action of the system; whilst that of Marsh Miasmata, and of Scarlet Fever, directly induces an universal debility. These phenomena will be found to depend upon their own specific quality, being varied by the peculiar states of the animal economy.

Whatever be the nature of that principle, which preserves each species of morbid poisons, observation and experience incontestibly demonstrate, that its power resists alike the influence of the atmosphere, and of the animal frame: from this it may be inferred, that they were intended to be the natural elements of these pestilential agencies; the latter for the purpose of propagation, the former for diffusion; while, it is probable, they both equally preserve the pestilential poison entire.—*See Appendix, No. 15.*

Although certain conditions of these elements are influential in modifying the forms, and degrees, which morbid poisons assume, in their several specific operations, in the human frame, yet they neither appear to possess any power in decomposing, or altering, their natures. They have been known to lie dormant in the animal body for months, and years; yet, upon their developement, from some exciting cause, they have displayed their primordial characters.—*See Appendix, No. 16.*



They are not only exempted from the atmospheric, and animalizing, or assimilating, influence, to which allusion has been made, but their specific natures seem subject to no admixture, or chemical affinities ; although they have been known to exist together, in the same constitution, for an indefinite period ; the one remaining quiescent, and latent, giving no visible indication of its presence, while the other was in action, and apparent ; yet upon the latter having finished its course, in the animal frame, the former has begun its career exhibiting its usual morbid characters.—*See Appendix, No. 17.*

The affinity, and coherency, of the elementary rudiment of each morbid poison indicate a degree of tenacity, and property of preservation, not surpassed by any organised body endowed with life. That morbid poisons hold a very close relation to the human frame, the most superficial observer can scarcely doubt ; it may be considered to bear the same aptitude to them, as the earth does to the seeds of vegetables ; neither could propagate its own species, without the intervention of its natural, and appointed, element. As far as a parallel can exist, the comparison holds good, the effect being the same, in both instances. It is necessary that the poison of each specific disease be primarily applied to some part of the human frame, that possesses excitability, before its reproduction can be accomplished ; here we recognise the body representing the soil, and the poison the seed ; it is true that the process varies, it being vital in the animal economy, and denominated secretion, or generation ; whereas the seed possesses

its own vitality and becomes developed, and vegetates, by aid of the natural elements. This regularity, and uniformity, in the generation of morbid poisons, will be found to be as strongly attested by experience, and experiment, as that which has been recognised in vegetables and animals. Indeed more remarkably; for though the latter are characterised by fixed forms, and natures, which are transmitted, and perpetuated, by generation, the offspring being stamped with the character of the parent; yet infinite varieties are produced by the intermixture of seeds between animals of the same species, and by the approximation of certain plants; while no degeneration, or change, is occasioned by the juxtaposition of the different morbid poisons in the human frame. If no decomposition, or breaking down, of the primordial poison be observable during the chemical ordeal, to which the several morbid poisons are exposed, during their passage through the animal economy, and the atmosphere, it would be absurd to assume that their specific qualities could suffer alteration, or destruction, from adventitious causes, or from the lapse of time; a very cursory glimpse at the pages of Natural History, and of the records of physiology, will tend to satisfy the most incredulous, that animal, and vegetable poisons, as well as morbid, are governed by permanent laws; that they are not subject to mutation, decomposition, or decay, and that they, at all times, and in all seasons, and climates, preserve their specific nature, and character.—See *Appendix*, No. 18.

All the phenomena of animals, and vegetables, are produced by the active principle of life superadded



to their several organisations; by the influence of this inscrutable power all animals, and vegetables, possess an innate, and independent means, of preservation. With equal correctness may it be said in relation to morbid poisons, the courses of which appear to be preserved with the same uniformity, that they are subject to a regular control; whether it be influenced, and regulated, by chemical, or attractive, laws, they are observed to retain their own identity, and to be qualified for transmitting it, through the instrumentality of the animal functions, unimpaired, and unchanged, to future generations. Throughout the whole range of the animal, and vegetable, kingdoms, in every instance that could be adduced, the unvaried form, and properties, of the species, show that the succession is not fortuitous, that the generative process is not equivocal. Generation (employing the term in an enlarged meaning) in animals, and vegetables, is a peculiar process by which an animated seed, or germ, becomes developed; each propagating its like; nature providently guarding, against the destruction of species, by specific generation.

If these observations be admitted to be true—in reference to the propagation of animals, and vegetables, as proving that each species is preserved by fixed, and immutable, laws, and not by chance, or fortuitous, circumstances—they are so strictly analogous to those, that are applicable to morbid poisons, as to afford a strong presumptive argument in favour of their being controlled, and sustained, by similar laws and provisions: the specific generation in the one, being an unequivocal illustration of the like process in the



other ; neither will the value of the argument from analogy, in the present instances, be diminished, because there is a slight difference in some of their relations ; re-production in both cases being accomplished by vital means. “The contrivance is the same” —to use the language of Paley,—“although there be the difference of life, and perceptivity, between the animal, and the plant, it is a difference which enters not into the account. It is a foreign circumstance. It is a difference of properties not employed. The animal function, and the vegetable function, are alike destitute of any design, which can operate on the form of the thing produced. The plant has no design in producing the seed, no comprehension of the nature and use of what it produces : the bird, with respect to its eggs, is not above the plant, with respect to its seed. Neither the one, nor the other, bears that sort of relation to what proceeds from it, which a joiner does to the chair which he makes. Now a cause which bears this relation to the effect, is what we want, in order to account for the suitability of means to an end, the fitness, and fitting, of one thing to another ; and this cause the parent plant, or animal, does not supply.” Just so is it with the successional reproduction of specific disease ; and though the process be obscure, and absolutely concealed from our senses, specific propagation is the result, which secures successional, and permanent, morbid species.

These reflections, I trust, will not appear misplaced, indeed they form so essential a feature in that line of argument, which is intended to be employed

throughout this portion of the enquiry, that I am happy to avail myself of their assistance, as they will facilitate, so materially, its progress.

As the disease, which forms the more immediate subject of our present consideration, is the result of the action of one of the morbid poisons upon the human constitution, these remarks appear to bear upon the principal point of the question: hence it follows, that the laws, which control morbid poisons in general, whatever they may be, may be considered as efficient, and permanent, in the government, and protection, of the poison of Scarlet Fever, as those which regulate the generation of animals, and vegetables; the functions in the human body, whether in health, or disease, being conducted according to fixed, vital, provisions. This comparative view seems consistent with reason, as well as with observation; it having been remarked, that a series of excitation, and reproduction, regularly succeed each other, in all the actions of morbid poisons.

By collecting the various facts, which are offered to our notice, and arranging them on the principles of induction, we become enabled to ascertain the general, as well as particular, regulations by which the operations of each are directed, and perpetuated. This process enables us to discover those mutual relations, which subsist between each specific poison, and the functions of the animal economy. If these immutable relations be established, it follows, in accordance with the course of nature, that the same round of phenomena will be exhibited at all times, whenever any of these poisons, and the human frame,



may be so circumstanced, that the susceptibility of the latter, is exposed to the specific agency of the former. Specific propagation, by whatever mode, or process, it be effected, implies a specific principle of production, both indicating design, and contrivance; and wherever, either in plants, or animals, we are able to examine the subject, we find procreation from a primordial seed. This constancy, and uniformity, in species, even when the rudiments are invisible, is sufficient presumptive proof of a peculiar, and immutable, principle, or essence; for these results could not ensue without that principle, or property, which was transmitted to them, at their formation, had been secured to them by certain fixed laws. Thus we find that each specific poison is empowered by certain innate, and independent, provisions, to induce specific action, in the human frame, which ultimately terminates in its peculiar propagation: what these provisions are, I presume not to hazard a conjecture—that there are such, no one can doubt, or deny. These, however, convincingly, and unequivocally, shew, that there are as much design, and creative power, displayed in the regulations that relate to the generation, and preservation, of morbid, as is evinced, in those laws which govern animal, and vegetable, poisons.—*See Appendix, No. 19.*

It would imply an overweening reliance upon the powers of human reason, and a sceptical reluctance to credit the words of infallible authority, to attribute the production of pestilential poisons to a spontaneous, or accidental, source, because our finite powers cannot discover the actual process by which they



are formed, or unravel their very essence, and nature, which are not objects of sense, and can only be recognised by their specific results. Such presumptuous, and unwarrantable, opinions, would tend to credit, and support, the doctrines entertained by the Egyptian Mythologist, who pretended to prove, from the phenomena of the universe, that all existence was to be referred to a material principle, and to natural causes. Thus they considered, as the primary source of generation (meaning nothing less than creation), heat acting upon a peculiar form of matter; and there is much reason to apprehend, that, in more recent times, even in those in which we live, this doctrine has not been without its advocates, who have laboured to support it with a great display of learning, and ingenuity. Even the phenomena which astonish the unlearned, and superstitious, and occupy the thoughts of the great, and of the good, in every age, as well as of the Philosopher, viz., the thunder, lightning, and earthquake, as well as plague, and famine, are traced, by them, solely to natural, and fortuitous, causes.—*See Appendix, No. 20.*

If the inevitable conclusions of such theories, and mistaken views, were permitted to influence mankind, well might we consider, that we were witnessing the retreat, rather than the march, of intellect. We, then, need not look beyond the material world for the cause, and source, of life, or the existence of any form of matter; for, if we found in nature the causes which maintain the whole order of the works of the universe, there would be no necessity for looking out of, and beyond, nature, for an intelligent, and cre-

ative, power. If matter take certain forms, and move, and act, in certain capacities, at certain times, and seasons, by powers, and properties, inherent in itself, and, according to laws, which are independent of its existence, there would surely be no reason to deny, that any form, or action, or property, that comes within our knowledge, may not be referred to matter, and the power of matter.

But it may here be observed, that no reasonable mind denies the influence, and agency, of secondary, and material, causes ; where the seed is sown, and where the egg is deposited, if circumstances be favorable, the plant, or the animal, will be produced. Who doubts that organised matter is endowed with properties, that enable it to generate organised matter ? But it has wisely been remarked, that to generate, is not to create ; no one will ever venture to affirm, that any animal was ever generated, where it was certain that the seed of animal life did not previously exist : these may not be perceptible to vision, or touch ; yet we are not to conclude that they have no existence. Seeds of various kinds are often suspended in water, in the atmosphere, and in various fluids, in which they remain latent, and invisible, until developed, and brought to light, by particular, and fostering circumstances. Yet we are not to admit that blind chance, and unintelligent nature, have the power to create animals, or vegetables, because organised animal, or vegetable, matter, which had been latent, and invisible, becomes developed by the aid of heat, and moisture. Generation, it must be recollected, is carried on by natural means ; but it is



still carried on according to the laws which the author of nature has given, and transmitted to nature ; neither can matter, operating upon matter, create species, or convert variety into species. We cannot attribute the fitness of things, the means adapted to the ends, the parts proportioned to the whole, every where manifest in the visible world, to blind chance, or to blind necessity. As order, proportion, and fitness, cannot fail to be recognised in the conformation of animals and vegetables, it is clear, that intention, and design, were concerned in their structure. The comparison which has just been made, is between organised bodies, endowed with vital powers of propagating their own species by means of organised seeds ; yet a very cursory survey of the specific generation in animals, and in vegetables, will serve to illustrate that process, by which the propagation of morbid poisons is accomplished in the human frame, as far as the points of resemblance will admit ; and which obtain in more instances between the subjects under consideration, than the reader, on the first view of the comparison, may be aware.

Although the virulent essence bears the same relation to morbid poisons, as the seed, and ova, do to vegetables, and animals, yet the former cannot be understood, in the common acceptation of the words, as being organised, or animated ; it is a morbid entity of the most subtle, and malignant, nature ; and may be presumed to possess a peculiar property of preservation, which—in relation to itself, to its own essence—is equivalent to vitality in seeds, and ova.

Specific propagation, by whatever mode or process



it be effected, has been admitted, by our ablest Physiologists, to imply, and indicate, design and contrivance; consequently, chance, or accident, could not have instituted it. This principle of continuance by generation will be found common to morbid poisons, as well as to animals, and to vegetables; though their several processes differ.

It is one of the characteristics of animated nature to multiply its species—which is accomplished by certain fixed laws under the control, it is presumed, of life, transmitted to each distinct species at its creation—which is distinguished by certain forms, habits, and characters, perpetuated by generation. By this wonderful, and inscrutable provision, the whole range of animated nature, each distinct species of animals, and vegetables, &c., which is found existing in the world at the present moment, has existed, according to infallible authority, from its first formation; such, at least, appears to be the result of the separate, and combined, proofs furnished by our own observations, and experience, respecting the laws of the animal and vegetable kingdoms. It has been transmitted to us by the voice of tradition, and of history—by the remains of antiquity—by every kind of collateral evidence, without even the necessity of having recourse to higher proof, which would be found to illustrate, and confirm, human evidence, in all its points. Varieties exist, and exceptions may be found to this, as to every other, general rule; each tree, and flower, as well as animal, and reptile, whether nocuous, or innocuous, exemplifies this fundamental law. Certain external cir-

cumstances have the power of modifying the stamp of original distinction ; yet this effect is evanescent, and will be found to terminate with the individual. It is immaterial by what means generation of species is effected ; it is sometimes in consequence, we learn, of subdivisions, or by production of shoots—in others, by the production of seeds, and of eggs ; the ultimate object is obtained with equal certainty, while each of these retain its vital principle, having received a peculiar excitability ; and although their actions, or functionary evolutions, are often suspended by adverse circumstances, in some instances for a great length of time, nevertheless, they are afterwards called into action, and build up the same structures of plants, and animals, endowed with the same characters, and properties, as the parent stock.—*See Appendix, No. 21.*

When subjects of this nature come under contemplation, it must always be born in mind, that the legitimate, and specific results, are all with which we have to do, and not the operations, and their causes.—*See Appendix, No. 22.*

From these remarks it may be inferred, that seed, in every form, is endowed with such specific properties, and excitability, as correspond with, and are restricted to, the individuals, which belong to certain species of vegetables, and animals. If such properties, to use the language of a scientific, and instructive writer, were not limited, but general, hybrid productions might become common, and ultimate confusion ensue ; and as the offspring resembles its parents ; great diversities of animals, and vegetables, would be

produced, so as eventually to destroy all original, and striking distinction of species, which have been instituted : from which facts, inferences may be drawn, that would, ultimately, serve to illustrate the immediate point under consideration, viz., the immutable, and absolute, nature of the essence of the several morbid poisons.

Although we note in the manner, by which animals, and vegetables, multiply their species, a uniformity of design, and a wonderful adaptation of diversity of means to a definite end, we remain totally ignorant of the precise manner by which such effects are produced, and brought about ; neither are we able to assign any adequate reasons for the facts we see, and record.

We cannot solve the difficulties which exist in any of the works of creation ; yet it is from such enquiries as these, that we derive the firmest conviction, that these *phenomena are not of spontaneous, or accidental, growth* ; but that they proceed from a cause inscrutable to man. If these observations be true, as they regard the generation, and preservation, of species, in the animal, and vegetable kingdoms ; from the regularity, and uniformity, observable in the phenomena which accompany, and are inseparably identified, in the propagation of the several species of morbid poisons by the animal function of secretion, similar relative laws, and provisions, may be presumed to exist, controlling their specific natures ; and it will be interesting, and useful, to notice, how strikingly the same kind of facts, and the same sort of evidence, that proved uniformity of offspring—and the same line



of induction, that implied the existence of regular, and immutable laws, in the generation of animals, and vegetables—tend to imply equally convincing evidence in behalf of the same uniformity in the provisions, which regulate, and preserve, the propagation of morbid poisons. By reproduction of the same specific character, and nature, uniformity is maintained as long as the exciting cause remains, and the same animal process preserves its vital influence—the lapse of ages producing no deviation from the original poison.

Specific diseases are essentially the same now as at any—even the remotest—period of our acquaintance with them. The best authenticated medical records convey to us those characteristic descriptions, and symptoms, which apply, in all important points, to each morbid species; and confirm their identity with each individual disease known at the present period. Each species of morbid poison includes, and maintains, its own virulent rudiment, as each animal, and vegetable, seed contains its own peculiar and vital embryo; the developement of the identical offspring, and species, in both instances, requires a generating medium, whether the process be of an animalising, or vegetating nature.

Can a stronger presumptive proof be discovered in favour of the permanency, and immutability, of the essence of morbid poisons, than their reproduction being dependent upon the fixed, and vital, function of animal secretion? By this provision they do not become the sport of every wind—resembling the dispersion of the thistle down, which is indiscriminate-

ly deposited in any soil, whether it be favourable, or unfavourable to its growth; the preservation of their morbid seed becomes certain, and appears to be directed, chiefly, against the inconstancy of the elements, or the sweeping destruction, and fluctuation of inclement seasons.

Of the constitution, as it has been called, of morbid poisons, we know nothing: yet, it may be presumed—although we are, as yet, not enough acquainted with their nature, to bring all their properties to the test of repeated, and familiar, observation—that unless it had been for the help of this immutable process of animal secretion, they might have been subject to a precarious direction, and to decay. Thus, while their *specific excitation depends upon their own peculiar constitution, their reproduction depends upon the process of another.*

In the economy of these morbid agents we remark a close analogy between that, which belongs to the animal, and vegetable, kingdom; it may be said that nature has gone out of her usual course in providing for their security. But, do we presume to say that the provisions, just contemplated, are not consistent with the course of nature? Have we observed no phenomena in the generation of animals, and vegetables, analogous to the reproduction of morbid poison? Peculiar provision, when we look a little more closely into their economy, will be found equally a part of nature's course.—*See Appendix, No. 23.*

In observing the operations of nature, in the working of secondary causes, we are constantly attracted by the variety of means employed for effecting the

same purpose—in generation, or reproduction, this is particularly conspicuous. In the vegetable kingdom, each elementary seed is endowed with the principle of life, in order that it should be capable of undergoing a certain process of developement, either by means of air, water, or earth ; the same remarks are equally true in relation to animals—the former, are essential to vegetation, while the function of assimilation, is necessary for the production of the latter. The seed would not be able to elaborate those phenomena which characterise incipient vegetation, and ultimately build up a perfect tree, or plant, without the aid of the natural elements, any more than the ovum can become developed without the assistance of the genial influence of heat.

It has been observed by naturalists, that one great intention evident in the structure of plants, and animals, seems to be the perfecting of the seed, and ovum, which implies their preservation ; and when this object has been accomplished—separation, and dispersion, seem the next care. Do we trace no resemblance, in the process just mentioned, to the preservation, and diffusion, of morbid poisons ? The seed, and egg, cannot answer their destined purposes, while they remain inactive, and confined to the situations in which they were generated, and deposited, or, within their several capsules ; neither can the essence of poisons produce its pestilential effects, and purposes, while it remains in a dormant state, either in the human frame, or in the atmosphere.

Although the relative processes are not, in every respect, similar ; yet, propagation, and dispersion are



attained by the changes, which each undergoes : and the result is that out of the many thousand plants, and animals, which cover the earth, and the various specific diseases, of which man is susceptible, not a single species, in all probability, has been lost, or withdrawn, since their creation.

The familiar, and most striking, properties of morbid poisons, are almost all that the compass, and limits, of our observations allow, or require to be brought forward : it must be acknowledged, they bear a strong resemblance to the preservation, and dissemination, of animals, and vegetables ; though the virulent essence cannot be considered in the light of an organised, and impregnated seed, yet it is endowed with a specific exciting power ; and though certain conditions of the human frame, and the atmosphere, are considered more, or less, influential in aiding its propagation, and diffusion, yet it can exist within the laboratory of both unimpaired ; and when it is considered, how frequently each species has been subject to this refining test, this animal and atmospheric ordeal, their power of concentration, and coherency, can scarcely be exceeded by any known kind of matter. For though a generative process, sufficient for the purpose, might be effected by means of the atmosphere, so minute, and inscrutable, as to elude detection by human vision, (and it cannot be denied that such may not be the case, especially as the morbid essence itself escapes our detection) yet it is not in unison with the course of nature, which is so uniformly simple, to believe—that a two-fold means would have been appointed to effect the same

end, when one process is ascertained to be efficient, viz. : the specific animal process of secretion, by which the propagation of morbid poisons is produced, and secured.

It is true, that animalcula have been discovered, by means of the microscope, to exist in water, the naked eye being incapable of discerning them; and it is highly probable, that others—consequently their ova—too minute to be detected even by optical means, may likewise exist in various fluids, all of which may severally undergo certain generative changes from the elementary influence : still, however, it must be remembered, that a *vital principle had been transmitted to each ovum, endowing it with the power of developement, under certain circumstances, by the aid of its natural elements ; while the virulent essence, it has been presumed, possesses no similar property ; although its specific excitation, when operating upon the animal economy, induces a specific action, which terminates in a peculiar production possessing all the qualities of the original morbid rudiment.*

It is obvious from what has been said, that although the atmosphere suspends and may in a certain degree influence, and relatively aid the diffusion of the poison of an epidemic, according to its humidity and rarity, &c., or according to the degree of its impregnation with human effluvia ; yet it exercises no generative power in its reproduction. The human constitution is subject to certain influences from climate, season, and peculiar conditions of the atmosphere, which render it more or less susceptible of pestilential taint—thus constituting a proximate exciting cause, aiding its

influence, and dissemination—but in no other manner can the air be considered as acting upon morbid poison, or upon the human frame, than has just been supposed.

*The generative process by which morbid poisons are reproduced, and a successional supply secured, is animal secretion, which is the exclusive property of vitality : this being one of those phenomena, which may be considered as established by observation, needs no further comment in this place : hence it may reasonably be inferred; that this process having existed, will continue unchanged as long as the animal economy is controlled by the same laws, which have governed it from its formation ; and the specific action of morbid poisons remains subject to those provisions, which were transmitted to each species at their origin. By this relation to each other, specific cause and effect become indissolubly, and immutably connected, precluding the possibility of change.*

From all that has been advanced, it may be concluded, that the peculiar property of each specific poison seems doubly secured—first, by its own laws, and secondly, by those of the human body, and the condition of the atmosphere, to which morbid poisons are presumed to hold so intimate a relation ; and as *identity in generation necessarily constitutes restriction in species, and as specific diseases are dependent upon the immutable functions of animal life for their reproduction, we learn how the poison of each may preserve, by this wonderful process, its essence and qualities.*

It is possible that the reader may consider there is still some ambiguity remaining respecting the abso-



lute, and immutable, nature of the essence of morbid poisons ; this, in all probability, will be found to have arisen from the imperfect manner, by which the argument from analogy has been conducted.

To remove such ambiguity, as regards the particular disease which it has been presumed arises from the agency of one of these poisons, I shall next proceed to notice briefly the historical evidence which has been produced upon this subject by others, as far as my own reading enables me, in as concise a manner as the necessary facts will admit, in the hope of satisfying him, that there is no ground for believing, *that any modification, or change, has been effected in the quality of its specific essence.*

This mode of proceeding will afford me an opportunity, at the same time, of shewing the variety of denominations, under which *this disease* has passed, *distinctly proving that specific infection has been its inseparable attendant, whatever form it has assumed, from its earliest appearance to the present day.*

A comprehensive view of the subject will, by this means, be secured, and a key to those seeming difficulties, and discrepancies, obtained, which have hitherto obscured the specific character of Scarlatina, as well as the phenomena of other morbid poisons. By thus contemplating, as they pass in review, the several forms, under which this disease has appeared, many practical inferences may be made, which may, ultimately, open to us a more distinct insight into the nature, and properties, of pestilential diseases in general, and display them with a perspicuity, which cannot well be misinterpreted.

Our minds become opened, and enlarged, by such enquiries, and whether we gain all the information we desired, or not, some advantage may always be derived from the pursuit.

Should any light be obtained from such interesting investigations, which can be directed upon the immediate object of our research, and, consequently, upon those subjects, indirectly associated with it, whilst we investigate the causes, and trace the series, of morbid actions arising from such deadly agents, solid information may not only be communicated, but the treatment of specific disease may receive some faint reflection, which may tend, ultimately, to enlighten this dark corner of medical science.

By thus examining Scarlet Fever in its historical detail, and considering its cumulative value as evidence, which cannot be of inconsiderable moment; the mind is more likely to arrive at conviction of truth, than by any train of argument, even though the strong one of analogy has been employed.

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## BRIEF HISTORICAL SKETCH

OF THE

**RISE, PROGRESS, &c., &c., OF THIS DISEASE,**

It has been observed, that it would be difficult to name a disease which has occasioned so much discussion, and controversy, as the one now under consideration. It appears to have been the most prevalent, and fatal, Epidemic of Europe, for the space of

two centuries, and has been known under a variety of names, assigned by an infinite number of writers, in various parts of the civilised world.—*See Appendix, No. 24.*

The term *Scarlatina* was first assigned to this disease by a medical author of our own country, and was employed simply to denote the characteristic efflorescence that usually accompanies this disease.

It has been said by a late distinguished and elaborate writer, who has brought much learning and research to bear upon, and illustrate, the subject now before us, and to whose works I am principally indebted for being able to lay the following sketch before the reader, that it is very uncertain at what period, and in what place, or nation, Scarlet Fever first appeared, yet that it is probable, that it was introduced into this country from the Levant, or the Mediterranean ; and he adds, that its origin might be referred particularly to Egypt, if the pestilential ulcers of the tonsils, described by ancient authors, and the malignant Scarlet Fever, could be proved to be the same disease, and remarks, that they do not materially differ from each other may be implied, from passages that might be selected from ancient authors.

It is highly probable that so painful, and malignant a disease, and one that is accompanied with so many marked, and significant symptoms, might have been one of those judicial visitations, that were imposed upon the Egyptians, as scourges. The land of Pharaoh was the plague spot of the east, and the hot-bed of corruption, and still continues to send forth, from time to time, its noisome pestilence ; and there is



good ground for believing, that Scarlet Fever originated in Egypt.—*See Appendix, No. 25.*

In examining the works of an ancient writer, it is very evident, in describing inflammation of the throat, and tonsils, that he had noted two species, one of which was attended with pestilential ulcerations; as he observes, in a succeeding chapter, that this species is accompanied *with fever and redness of the face and neck*—hence it may be inferred, that he was describing malignant Scarlet Fever.

That the *affections attended with pestilential ulcers of the fauces, and throat, were familiar in Egypt and Syria, may be inferred from their being called the Egyptian and Syrian ulcers*; it is observed, that the death they occasioned was most miserable.

Another author says, that these *pestilential ulcers take place mostly in children, and in females at the age of puberty, and occasionally afflict adults, if the state of their health be bad*: and adds, *that the fever is vehement, and that the principal danger occurs during the first seven days.*—*See Appendix, No. 26.* These several points are all peculiarly applicable to Scarlet Fever.

In Arabia, it was known, about the same period, under the title of Al-hemeka.—*See Appendix, No. 27.* But Ingrassia, who has been considered the first writer of modern times, has described Scarlet Fever, in his works, under the name of Rosalia; he distinctly states that it was known to the Neapolitans before the year 1500.

In the beginning of the sixteenth century, a contagious sore throat proved extremely fatal in the

neighbourhood of Amsterdam, and may be considered as an *Epidemic Scarlet Fever* of the most malignant kind. A similar disease, about the middle of the same century, spread through Lower Germany, *proving chiefly fatal to infants and children*, and, a few years afterwards, was epidemical in Paris; the account given of this disorder, Dr. Willan observes, clearly comprises the principal varieties of Scarlatina. The author from whom he has taken his information, compares *the efflorescence to a blush over the whole body, observing that this appearance, if no fever had preceded it, was not formidable*, but those, who were affected with the disease in its mildest form, often brought on through neglect, or mismanagement, a fever of the most malignant kind. All this is strictly true, respecting the nature, and appearance, of Scarlatina. This distemper seems to have raged in 1575 in Paris with great virulence, and to have proved fatal to adults, and females. But the most marked, and extensive, instance of its fatality occurred during a period of 40 years, and is said to have originated in Asia at the latter end of the sixteenth century, and to have been rapidly diffused throughout all Europe. In Spain it originated at some of their sea-ports, and was soon spread, through the interior; it was accompanied with a malignant ulcerated sore throat of a most fatal kind, to which the Spaniards gave the name of Garrotillo. Thence it was communicated to all the sea-ports of Italy, Sicily, and Malta. It appeared in Naples in 1618, and was considered as a new disease, and received an infinite number of names, among which will be found the malignant and pestiferous

sore throat, the *Egyptian* and *Syrian ulcers*, &c. &c. I have especially selected these titles for the reader's contemplation, as they imply the origin, as well as nature, of the disease. However, it does not appear to have *affected all the individuals of a family, it only proved fatal to persons of a weak temperament, and to children*, and in some houses all, who were seized with it, had it in a very mild form.—*See Appendix, No. 28.*

Dr. Willan has pointedly remarked, that the identity of Garrotillo, and malignant Scarlatina, does not depend upon negative circumstances, but can be proved, by direct, and authentic testimony. The writers at this period all mention the scarlet efflorescence, and observe its frequent appearance with the Garrotillo. Another writer, of great celebrity, among several interesting facts respecting this disease, says, that in the spring of 1618, the sore throat began to affect children, and became in the following autumn highly malignant; that on its breaking out, adults were affected with the efflorescence only, but when contagion was extensively spread among children, that adults were likewise seized with sore throat, that some had symptoms so favourable that they seemed scarcely to have the same disorder. Dr. Willan observes, “the testimony is so clear and decisive, I think it unnecessary to quote further authorities in proof of my position, that the Garrotillo in Spain, and the epidemic sore throat at Naples, were in every respect similar to the scarlet sore throat of later times.” While this disorder raged with so much virulence in the southern states of Europe, the milder forms pre-



vailed in different parts of Germany under various titles. At Leipsic, we learn, it was known by the name *red-miliary fever*. The writer, who has furnished this account, has given us so natural, and scientific, a description of Scarlatina, as to induce me to lay it in detail before my readers, he observes *one form of the disease is characterised by redness of the eyes, a vivid red-rash sometimes over the whole body, sometimes in settled red patches, great heat, roughness, and itching of the skin, general debility, restlessness, and frequent bleedings from the nose ; that between the fourth and sixth day, the redness of the skin was at its height, or rather declining, and that it subsided by the cuticle peeling off*. Several writers of high authority noted, that the epidemic of Leipsic was extremely fatal to women in child-bed—that it usually appears on the third or fourth day, after their confinement, has been clearly shewn by Dr. Willan's reports on the diseases in London. In 1786, many instances of this kind occurred while Scarlatina was prevalent in the Metropolis ; in ten years after there was a still greater mortality in lying-in women. Dr. Withering informs us, that at Birmingham, Scarlet Fever, and sore throat, were particularly fatal to puerperal women.—See *Appendix, No. 29*.

At Presburgh, we find it prevailing in the latter end of the seventeenth century, and is designated as a military fever ; it is described as accompanied *with so intense a redness over the whole body, that it appeared as if it had been wrapped in red cloth*. Under the denomination of the *malignant, and purple epidemic*, it has been described in the middle of the

preceding century as spreading through Poland—a few years afterwards it was noticed by various authors as prevalent in Denmark, Holland, Switzerland, Lombardy, Bavaria, England, and Scotland, under different names, as the *scaly Rosalia*, *Scarlatina*, &c. In 1677 to 1682, we read of it existing *as an infectious epidemic*, in different parts of Germany. At the close of the seventeenth century, it received an infinite variety of names, descriptive of its malignancy, as well as of its infectious nature—specifying at the same time the particular ages, and constitutions, most subject to its influence.—*See Appendix, No. 30.*

At this period it was raging in Dresden, as well as Wirtemberg—it visited Hungary, and ultimately reaching Saxony, it proved extremely fatal in Leipsic, and continued in different parts of the Electorate more than fifty years, occasionally exhibiting its *different varieties, from the mildest to the most virulent*. The writers from whose works this account has been taken, say, *that in the latter stage it was attended with dropsy*.—*See Appendix, No. 31.*

From the close of the seventeenth, to the beginning of the eighteenth century, Scarlet Fever raged at Berlin, the Netherlands, Sweden, and Italy, until the middle of the last century, under numerous titles. De Haen, and Van Swieter, authorities of great weight, considered the *ulcerated sore throat*, that was so prevalent in Holland, as the *worst sort of Scarlatina*.

Dr. Morton, it appears, was the first English Physician who has given an enlarged, and faithful account of this disorder; he mentions the affection

of the throat, and all the other symptoms, characteristic of Scarlatina.

In the Edinburgh Medical Essays, we learn that children were attacked with Scarlet Fever, which became an extensive epidemic in 1733; and that in the succeeding year it appeared at Kingston, and spread gradually from thence westward, over all the colonies in North America, *for two years, and that it was a prevailing epidemic* in Hudson's Bay. Dr. Huxham has noticed, that an epidemical disorder, resembling Scarlet Fever, broke out in several parts of Devonshire, and Cornwall, about a year, or two, previous to its appearance in America; and is inclined to think it probable, that the infection was conveyed to America by ships cleared out of Plymouth, Falmouth, or some other southern ports. He mentions this disease under the denominations of *the red miliary fever*, *the malignant fever*, and adds, that the *simple Scarlet Fever frequently occurred with the ulcerated sore throat fever*.

It may here be observed, that the malignant ulcerated sore throat, described by this Physician, was the malignant Angina of Dr. Fothergill. In 1743, the malignant Scarlatina appeared at Paris, and proved nearly universally fatal in that city; principally, it is apprehended, from the injudicious treatment of the Physicians, who attempted its cure by bleeding,—*See Appendix, No. 32.*

From the account given by Physicians of the epidemic, which appeared in London in the years 1747 and 8, there can be no doubt of its being Scarlet Fever; this opinion is corroborated by a correspond-



ence which took place, and which may be consulted, between two distinguished Physicians, Dr. Cotton, and Dr. Mead, shewing that it had spread to St. Albans, as well as to adjacent towns and villages.—*See Appendix, No. 33.*

About this period a malignant form of Scarlet Fever prevailed in Cornwall ; and we find a similar disease raging in Holland. Shortly after this, a writer of considerable authority and ability notices its appearance in North America—similar epidemics are noted by several Physicians of eminence in different parts of Britain, where it has been known about 170 years. Dr. Willan observes, it may be concluded that no British author has described any *epidemical, and contagious sore throat, except that which attends Scarlet Fever*. The title, *malignant sore throat*, would have applied with equal, if not with more, propriety, to the *sore throat connected with a different species of infection, viz., that of Typhus, and putrid fever*, displaying itself frequently in the habitations of the poor, where no attention is paid to cleanliness and ventilation. *The fever and sore throat are sometimes communicated together ; but the disease, thus complicated, does not become epidemical like Scarlatina, nor is it attended with any efflorescence or eruption, excepting Petechiæ (purple spots), which mark its extreme malignancy and putridity.*—*See Appendix, No. 34.*

*It is often fatal, but not at so early a stage as the malignant Scarlatina ; it may also be repeatedly received, whereas the Scarlet Fever occurs but once in the same person.*—*See Appendix, No. 35.*

It would be needless to particularize the accounts

which have been given by many eminent, and distinguished practitioners in our own country, as their works are well known to the professional reader, and their several merits duly appreciated. The preceding narrative was sketched for the contemplation of the non-professional reader; to afford him, as far as the history of the disease will admit, the means of judging of this species of evidence himself. He will, in all probability, readily pardon the omission of further detail, after wading through, what he possibly may think, the most uninteresting portion of these pages.

The rapid, and cursory, review which has been taken of the historical evidence touching Scarlatina, may serve to convince the reader, that it, probably, originated in Egypt; and that, after pursuing its pestilential course through Europe, and other divisions of the known world, it reached this Island, where it has sojourned with unabated malignity, for the greater part of two centuries: that it has preserved its essential, and specific characters unchanged—that it is particularly fatal to children, and to women in child-bed—that the term Scarlatina was first employed to designate its characteristic efflorescence—that it has since been adopted as its special title—that its visitations are epidemical—that there is reason to believe that it still continues the most common, and the most fatal disease, as an epidemic, in Great Britain—and, although it has travelled in succession, with different severity, through every part of the globe, without slumbering, or sleeping—for it would not be very difficult to shew, that its virus has never been suspended, or removed from mankind, since its first known ap-

pearance—and its visits have neither been few nor far between to any people or nation—yet there is cause for entertaining the apprehension that the destroying Angel has moved with a too studied regularity to admit of a doubt, that his course has been directed by a more uniform, and controlling power, than chance or accident, although it may be inscrutable to man—who has neither been able to stand before his presence—to arrest his steps—nor alter his course. This view of the history of the disease, will at the same time shew that the numerous titles, assigned to Scarlet Fever, arose from an arbitrary selection of such as seemed to define forcibly, and clearly, those prominent symptoms, which were considered most urgent, and dangerous. In contemplating this part of our subject, it is curious to note how many years, nearly centuries, passed by before any definite name became affixed to this disease.

The affection of the throat, we learn from all quarters, especially attracted attention, and excited alarm; and although the ancients never omit making particular mention of this symptom, we are indebted to the modern writers for the characteristic definition, and epithet, which are in familiar use at the present day. We are not to conclude from this, that the Scarlet efflorescence had escaped the vigilance, and observation, of the former, as instances are not wanting in their works to warrant the belief that it had been noticed by them, and that they had invariably considered it as indicating an infectious nature.

From the view that has been taken, in the preceding pages, of the subject under our immediate consi-



deration, it may, without presumption, be inferred, that there were grounds for advancing the propositions set forth in the title page ; and although the proofs may not have been demonstrated with logical regularity, and perspicuity, yet the writer would fain hope, that if he has not arrived at certainty in his inductions, he may yet lay some claim to having obtained an approximation to the truth. I conceive it to be quite unnecessary, in briefly recapitulating the leading points of our enquiry, to occupy the attention, and to fatigue the patience of the reader, by laying before him any further particulars, beyond those morbid phenomena, which were premised, and specified, at the opening of this work, and which have been dwelt upon during this investigation.

Thus, by way of concluding this stage of our proceedings, we may venture to infer that the virus of Scarlatina is peculiar, and absolute ; that this disease is specifically infectious in all its forms ; that the term Scarlatina is employed as the established name for this disorder ; and that its several varieties are denoted by their appropriate, and distinguishing epithets, mild, severe, and malignant, according to the degree of the fever, and of the affection of the throat ; or of the constitutional excitement, and debility that are found exhibited during their pestilential progress.

To trouble, and perplex, the non-professional reader, with niceties, and shades, of nominal distinctions, could be of no utility to him ; these having been marked with sufficient strength to render them intelligible. It will be enough, for every general purpose, to be convinced that specific infection is invariably

identified with each variety : indeed the more closely we examine the subject, the more strong will the conviction be, that the disease is, in all its forms controlled, and influenced, in its generation, preservation, and dissemination, by peculiar, and immutable, though inscrutable, laws ; and, if the contrary principle were admitted, Scarlatina, and every other pestilential disease would cease to preserve that uniformity, and specific character in their course, which form their very existence, and nature—as a total loss of specific difference, and character, would be the inevitable consequence.

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## CURSORY OBSERVATIONS

UPON

**THE TREATMENT, &c., &c., OF THIS DISEASE.**

Finding that I have already far exceeded the limits, which I had proposed to myself at the commencement of these pages ; and although I am aware that there are many points, which have not been brought forward, of no slight importance, in considering the question, of which I have been treating ; yet sensible of having been carried away by the interest I have taken in this subject, I shall, in as brief a manner as is consistent with perspicuity, endeavour to draw to a close these transient observations.

In accomplishing this design, I shall proceed to pass some general remarks upon the treatment, which has, at various periods, and in different countries, been

adopted in Scarlatina, and which has undergone as much change, and has been subject to as much variety, and discrepancy, as any specific disorder on record. If these had been the only evils to have regretted, in the remedial means recommended during the progress of the different stages of this disease, it would merely have shared the same fate, to which other maladies have been subjected, before any fixed plan of treatment had been agreed upon, consistent with its nature. It is, however, notorious, that the extremes of practice have been conspicuous, and pursued with more assiduity, and pertinacity, by their several advocates in the present, than, has been observed, in any other known instance.

At these opposite points the opponents have taken their stand ; the one loudly declaiming in favour of the lancet, while the other, (with more probability of truth,) have proclaimed the sovereign use of bark ; and although the system of general bleeding has long ago been discarded, from the great fatality it occasioned, yet the latter, it is to be feared, has still more adherents than experience justifies. Between these extreme points others have appeared, taking a safer position, hoping, by steering a more moderate course, to avoid those errors which their predecessors had committed. Some of these had occasional recourse to the use of the lancet, while others exhibited the bark in a milder form, and more moderate quantities, through the whole course of Scarlatina. It is, however, very evident from the medical reports of the period, to which allusion has just been made, that the adherents of these opposite plans, especially the for-



mer, pursued their different objects with an unprecedented infatuation, and fatality.—*See Appendix, No. 36.*

Still many years passed by before the separate, and widely scattered opinions, and systems, of practitioners in different regions could be collected, and examined; and it was not till the latter part of the last century, that we find the basis of our present treatment of Scarlatina was laid. From that period the improvement in practice, though gradual, may be easily discovered, arising from a more accurate knowledge of the human frame under diseased, as well as healthy, action; as well as from those accessions, to which the science of medicine in general has been indebted.

It is not necessary, in this place, to review, and point out, the successive steps in the progress of so interesting, and important a subject; as the just tribute of our gratitude has long since been awarded to those distinguished individuals, who have contributed so largely by their useful labours to the accomplishment of this important end; and to whose talents, and to whose exertions, the practice of medicine is so deeply indebted.

It would be an invidious task to select the names of any in particular, by whose contributions the healing art has received the most important accessions; or to attempt to weigh, as an able writer has said, genius against acquirements, or to decide, whether the quantity of discovery in one were equal to the quality in another.

The progress is generally slow, and even-paced, by

which all human institutions advance ; and when we contemplate the variety, and number, of the auxiliary studies, and acquirements, which it is absolutely necessary for those to possess, who devote themselves to the practice and improvement of medicine, there is cause for surprise that the science should have reached the present eminence, rather than for reproach, that it has not made further advancement.

The enlarged views which have been unfolded by the recent discoveries in physiology, and morbid anatomy, have not only proved our surest guides in affording correct notions of the healthy, and deranged, functions of the animal economy, but are the only sure tests, and criteria, for estimating and indicating the means, by which we are directed in our attempt to preserve health, to alleviate and remove disorder, and cure disease. Based upon a broader and more comprehensive knowledge, with minds enriched with every necessary attainment, we beheld a few practitioners, thinking for themselves, venturing to break through the trammels of prejudice, and system, ultimately succeed in establishing a practice more consistent with the nature of the disease, and more consonant with the laws of the animal economy.

Though the use of the lancet, during the presence of Scarlatina, may now be considered as forbidden, yet the occasional use of local bleeding is admissible in certain rare cases ; and although the character which the Peruvian Bark once acquired as a specific in this disorder, is, in the estimation even of those who were once its advocates, nearly, if not altogether, lost, yet its employment in cases of extreme

malignancy, and putridity, at the termination, and after the close of this disease, is still approved in the character of an antiseptic and tonic.

The reader will at once observe, from the preceding reflections, that local depletion may be necessary, when general bleeding is forbidden ; and though the use of bark be incompatible in an active dose with the nature of Scarlatina, still it may be serviceable in arresting putridity, and in restoring the powers of life when weakened by diseased action.—*See Appendix, No. 37.*

As these practical points exclusively belong to the members of the profession, it would be useless to pursue them further ; neither would they have been noticed in this place, but with the view of reconciling an apparent discrepancy in the preceding remarks upon the remedies just now mentioned.

In pointing out the most bold, and prominent features in the treatment of this disorder, the system of *immersion* deserves more especially to be noticed ; this was introduced by a physician of eminence in Liverpool, and for many years was more or less generally adopted in the treatment of Scarlatina, by practitioners of considerable respectability within our own times. This system has given way to the safer, and more efficient, practice of *ablution*, which is accomplished by sponging the body and extremities with cold vinegar and water.

As the *principal object* to be obtained is the *reduction of heat*, which is so excessive in this disorder, experience has proved that this point can be obtained more effectually by ablution, than by immersion ; if



this simple process be judiciously performed, so *gradual an evaporation is effected, that the preternatural heat of the body may be withdrawn without any risk to the patient, or fear of repelling the disease.* The reaction, and shock, consequent upon cold immersion, are thus avoided, and the powers of life are protected from that excessive excitement, which is in so remarkable a manner identified with the high temperament of Scarlatina, and which may, in truth, be considered as constituting its most fearful, and unmanageable symptom. The immediate effects, produced by immersion, would be the direct means of exciting the very symptom of excessive heat, (as is proved by the glow which is consequent upon cold bathing)—preternatural heat being the inseparable consequence of increased action.

This being admitted, *the superiority which ablution possesses over immersion, when the morbid heat of the surface of the human body is to be diminished,* daily experience has convincingly established.

The effects of cold water, and cool air, in mitigating, and arresting, the progress of some of the most formidable febrile disorders, have not passed unnoticed, or disregarded by ancient writers on medicine; but it appears to have been reserved for those of the modern school to establish a more critical, and specific application of these active, and important, remedies.

One of the striking effects of ablution is, its inducing sleep, which is invariably found to accompany a diminution of temperature, and excitement. A more unequivocal proof of the benefit instantly afforded by

this plan cannot well be conceived ; and although it does not suspend, or remove, the whole train of morbid actions, as the advocates for immersion have attributed to their bolder system, yet it invariably diminishes, and mitigates, the preternatural accumulation of heat, and excitement, which are objects of the most urgent consideration, and which, if neglected, and allowed to take their own course, would become a cause of their own increase, and continuance, and ultimately destroy the powers of life.

Sponging the extremities, and surface, with cold vinegar and water, is recommended, not as a curative, but as a salutary, and preservative application, seldom to be omitted in Scarlatina, and always to be employed with advantage. Unlike other remedial applications that are limited to stated periods, this plan may be executed at any time—night, or day—*whenever there is no sense of chilliness present, whenever the heat of the surface is steadily above what is natural, and when there is no general, or profuse perspiration.*—See Appendix, No. 38.

In strict accordance with the principles, that recommended the adoption of ablution, will be found each part of the present, and most approved, treatment of Scarlatina.

In contemplating the alterations, and improvements which the chastening hand of time, and experience have effected in those strong, and extreme measures, which were taken in the more early treatment of this disorder, before its nature, and influence, upon the human frame were understood, they will be found to have kept pace with the general advancement of me-

dical science ; and by tracing them in a certain chronological and successional order, we should be imperceptibly brought to the consideration of those principles, which constitute the foundation of the present practice, and which will be found to arise from a more accurate knowledge of the nature of the specific virus of the several morbid poisons, and of the condition of the animal economy under diseased action.

It has formed a prominent feature in the preceding pages to establish the conviction, that the *virus of Scarlatina is absolute, and its influence specific* ; from which it has been inferred, that its *excitation is inseparable from its quality*, and that, however varied the form, and aspect it may assume in different constitutions, *its nature, and influence, can be subject to no essential degeneration, or change.*

If we were to search the whole range of the works of nature, it would be difficult to find a more sufficient reason for asserting that any property belongs to any substance than in the certainty, and universality, with which the quality, and efficacy of Scarlatina accompany each other : neither could a stronger instance be adduced of the relation, which an inanimate substance holds to an animated body, than that which the virus of Scarlatina bears to the human frame. The result of such aptitude is, specific reproduction, which secures the permanency of species.

Can the chapter of accidents, it is asked, destroy such relationship, and such sequences ? Experience, and observation say no ; if there be such a thing as a course of nature, the laws which are formed to control it are immutable.



In reference to the disease in question, we learn that its course is limited, and definite; beyond which critical bounds it never passes: neither can its steps be arrested or stopped during its course through the human frame by art, any more than by season, or climate, chance, or time; it alike defies all their influences. As an epidemic, or when its course is in the air, it has been supposed not at all times to obey the winds, for it has frequently been observed to steer a contrary direction; choosing apparently its own path, and travelling its own wayward course; this phenomenon, however, admits of another more natural and significant solution—it may be considered principally to depend upon human agency—uninfluenced by latitude, seasons, or atmospheric changes, and causes, its progress is observed to follow and accompany human intercourse, and communication, as well as the conveyance of articles of merchandize.—*See Appendix, No. 39.*

If these facts be admitted, it is obvious that our remedial administrations should be directed to the body, not the disease—be preservative, not specific.

To attempt, with our present limited knowledge, to cure or remove the diseased action induced by the specific virus of Scarlatina, having once got possession of the body, would imply an ignorance of the nature of that specific operation, which is the result of specific excitation. Few, if any, would be found among the practitioners, of the present day, to make so empirical an attempt. What opinion, it may be asked, would be entertained of the man who would profess to cure Small Pox, or Measles?

By these remarks, it is not intended to deny the efficacy of certain specific medicines : yet it is notorious that there are other diseases, of an infectious and peculiar nature, over which medicine has no specific control, among which may be ranked the disease now under consideration.

With these facts before our eyes, with the admission that the course of nature is regular, and with the knowledge that the deleterious influence of morbid poisons depends upon the *quality, not the quantity, of the particular virus of each*, our practical desiderata should principally relate to the state of the constitution : and however various the forms, and degrees may be, under which this disease may appear, yet knowing that the morbid course is uniform in the leading points, and principles of the means, by which its specific action is accomplished, a tolerably correct opinion may be formed from the leading, and general, results of its influence,—the prostration of strength, and the affection of the throat, manifested in the first stage of Scarlatina. These morbid tests may, in most instances, guide us in judging of the particular variety which the disease is about to assume ; although experience has shewn that the simple, and severe form, will frequently terminate in the malignant, from peculiarities of constitution, as well as from mis-management.

As all the morbid phenomena, which appear in Scarlatina, denote clearly that its virus is a direct sedative, beginning, and ending, in debility ; all our endeavours should be directed to *sustain the vital powers without increasing the constitutional excitement* ; and this can-



not be accomplished with greater prospect of conducting the patient to a favourable issue, than by removing every cause of irritation from without, as well as from within ; by the free use of cold ablution, according to the rules laid down ; by constantly washing the throat with un-irritating, and detergent gargles ; by cleanliness and ventilation, and by such nourishment and medicine as will support the system un-irritatingly, and are best calculated, by their anti-septic nature, to preserve it against the deleterious influence of the disease : always remembering that its virus is at deadly strife with the powers of vitality, and that while the system is under its influence it may be said, in the language of our great dramatic Poet, “ that rank corruption mining all within infects unseen.”

It is generally observed to select and taint the young and delicate ; yet, instances are not unfrequent of its pulling down, and prostrating the vigorous and robust.

Sufficient has already been said on this part of our subject ; more especially as the chief object, in passing these observations upon the general management, and treatment of this pestilential disorder, is to convince the public of its absolute, and specific nature—that they are not to expect, from the profession, a specific remedy for the cure of Scarlatina, but to receive such directions in the management of the sick, and such a medical course, as tend to protect the powers of life. This may be termed the rationale of our positive remedial administrations in Scarlatina.

If the reader had been led to expect that I should furnish him with familiar receipts, for the domestic treatment of this formidable disease, he will experience



considerable disappointment. Family libraries have long been too loaded with short, and convenient, works upon domestic medicine, to need any further addition : many a valuable life has been lost by permitting the first stages of disorder to pass by, before professional aid had been called in, and by trusting to the plausible delusion of these extra-guides. From such sources of compendious instruction much evil has arisen : they arm the ignorant, and presumptuous, with a two-edged sword, which they may exercise to the injury of themselves, and of their neighbours.

It is admitted that every one should in such a sense be his own Physician, as to understand how to preserve his constitution in health ; yet if the treatment of diseases in general, was to be placed under non-professional superintendence, the members of the profession might be stripped of that responsibility, to which their studies, labour, and experience exclusively entitle them, and ultimately be despoiled of that meed, which a liberal and enlightened public seldom, if ever, deny to those, who merit their confidence and support.

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## PREVENTIVE MEASURES CONSIDERED.

It now remains that I should say something on the score of Precaution. After what has been advanced, and is already known, upon this important branch of

our subject, I should not have been unwilling to have left the matter entirely to the good sense of my readers, and of the public; had there not been some peculiar, and significant features in the disease, more immediately under consideration, to which I am desirous of directing their especial attention.

In doing this, it will be unnecessary to enter into any further recapitulation, than to mention, briefly, those points, to which allusion has just been made; as sufficient has already been said touching the specific quality of Scarlet Fever—the nature of its infection—the manner of its propagation—and the means by which it is disseminated.

The points that have been selected exclusively for our present consideration, are the following, viz.,—that when Scarlet Fever is said to exist as an epidemic, it is, in the majority of instances, traceable to one, or more insulated cases among the lower classes, and that its subsequent spread is in direct proportion—that it preserves a limited, and critical, course, and that it passes through the human frame once, leaving it unsusceptible of a second infection.—*See Appendix, No. 40.*

In passing our eye over these particulars, it will be perceived, that this disease has many redeemable points—that the case is not desperate, or hopeless, neither is it interminable—for though we have not the bane, and the antidote, before us, we have in our power the means of prevention.

These instructive, and striking facts, clearly prove, that Scarlet Fever, in the character of an epidemic, has a small, and circumscribed beginning—that it

generally lets fall a few solitary seeds (a single one being sufficient to infect thousands), leaving their future propagation, and dispersion, to human instrumentality—for the frame of man, it has been presumed, is its exclusive attraction—its appointed end—as well as its propagator.

It is not intended to assert, that an epidemic is invariably so limited in its influence, as to infect only one, or two individuals, at its commencement, or that it may not return to renew its pestilential visitations a second time ; yet, the seed having been sown—the mischief committed—the work effectually begun—and being left to a certain inter-medium (if uninterrupted, and uncontrolled) for its ultimate dispersion, it would appear contrary to the usual course of nature, that a renewal of the same cause should be inflicted, while its primary effects were at work. Be this as it may, our attention must not be diverted from the main points—namely, the precise time, and stage of the disease, at which it would appear that our remedial, or counteracting, measures, should be interposed, to justify any prospect of a successful issue. The beginning, then, is the appointed time—the critical juncture—when separation of the diseased from the uninfected should be accomplished, to ensure success. To interpose at this moment—to throw every obstacle across its path, that may obstruct its progress—to arrest its very footsteps at the commencement of its course,—becomes the primary object, and one of the greatest practical importance. For although we may not be able to stay an incoming plague, or avert a threatened pestilence, we may arrest their progress, and shorten their sojourn.



When an inundation threatens a district, its inhabitants would not shew their judgment, and forethought, to wait till every streamlet had been swelled before they offered resistance to its increasing impetuosity. It would surely indicate a sounder, and better, frame of mind, to arrest the water-course before its actual irruption. Let us, then, exercise our discretionary wisdom, when a pestilential torrent is coming down upon us—let us go to the well's head, if it be discernable—there offer resistance to the overflowing of its bitter waters, before its inundation has advanced, not waiting till it has spread far, and wide—for, though the spring itself may be placed beyond our reach, its reservoir may be under our control; and, although we may not command the power of sweetening its water, we may preserve others from tasting their bitterness. It is no small consolation, whenever we are denied employing positive, to be able to use preventive, means. Thus to avoid an evil, when no remedy is at hand, is assuredly justifiable, and no inconsiderable mark of discretion in any people, under any circumstances of danger—it would indicate a reproachable apathy to succumb to the pressure of any calamity, unless conscious that all our resources had been exhausted.

If it be questioned, whether the evil complained of be sufficiently great, or frequent in its recurrence, to require a national, and legal, enactment for its restriction, let those determine, whose official duty it is to announce, and enforce measures for public welfare, and security. It is my humble task to submit to their consideration, as well as to that of the

public, the necessity there is for adopting some preventive measures, and to point out the means best calculated (as they seem to me) for attaining so desirable an object.

The facts related in the historical sketch distinctly, and with due authority, shew, that Scarlet Fever has been one of the most fatal epidemics in Europe, for nearly the space of two centuries; and while the experience of the present, as well as of the past, addresses us in language too audible, and forcible, to be unheard, and misunderstood, viz. : that this disease is not upon the wane—that it is neither diminished, nor diminishing—that it does not evince a disposition to decline, although it seems to be of a character susceptible of self-cure—it does appear to my mind to be a consideration of the highest vital importance, both in regard to its influence upon the welfare of its immediate objects, and the interest of succeeding generations, to enquire, whether the ravages of this disease may not be so effectually restricted, as to save an incalculable waste of human life.

It has been proved, beyond all probability of doubt or cavil, that by *separation, and seclusion*, combined with other auxiliaries, *security has been obtained* from the subtile infection of Plague, and of other pestilential disorders, even within the focus of their influence. I am not unprepared to find that there are those, who see no necessity for any legislative enactment to enforce a system of restriction, among the lower classes, excepting against the Plague. To such persons I should reply, that although I do not presume to dictate to those, who are placed in authority over us,



yet I may venture to suggest, solicit, and promote, as far as is within my own power ; and to induce those, to whose view these pages may be submitted, to enquire, reflect, and form their own judgment, upon the topics, to which they relate. This has been my object, and if it should be thought that I have erred, either in my design, or suggestion, “let it be remembered that excess of caution is an error not likely to do much harm ;” if it should prove that we are right, it will afford a satisfaction, to have used our best endeavours to enable the country to diminish so much dreaded, and positive, an evil.

It would be difficult to select a specific disease, better calculated for a practical test of the description here alluded to, than Scarlet Fever ; its individual, and insulated, origin—its after propagation by human, and involuntary, means—its limited, and critical, course—and its self-cure, form a combination of circumstances most favourable for such a trial. Again, the frequent recurrence of its visitations—the fatality attending them—the long train of miseries it excites—the extensive, and continued, course it has pursued, especially in the northern part of this island, during the last twelve months, suggest the fearful apprehension, that, though an exotic, it may assume the character of indigenous growth, and become a national pestilence to the rising generation.

It is high time that a conventional, and more efficient, opposition be offered to its increasing ravages—indeed, it is indispensable for the welfare of individuals, and of the public, that a strenuous, and persevering effort should be made, and one which should meet with universal concurrence, and support.



We have, by the preceding train of thought, imperceptibly been led to the consummation of our design,—the nature of which might clearly have been anticipated, from the tendency of all that has gone before.

If the whole catalogue of drugs has hitherto refused to afford either an antidote, or specific, we shall surely be justified in having recourse to the voice of experience, and adopting such means of precaution, as have been in so many instances all-sufficient ; until the discoveries of science, and the results of experiment, shall hold out a boon that may more effectually alleviate, or more directly counteract, the evil that awaits us.—*See Appendix, No. 41.*

I have dwelt thus long, and earnestly, upon this portion of the subject, in order to shew, that the opinions, here entertained, have not been hastily taken up, either from the assertion of others, or from my own prejudiced views—and to prepare my readers to receive, without surprise, or disappointment, the familiar, and only alternatives, which offer any well-grounded hopes of success.

We are now brought to the contemplation of the means—and until a positive remedy be discovered, *precautionary measures* alone present themselves ; and experience, and reason, alike direct us to have recourse to *absolute separation, and seclusion*, of the infected, combined with other necessary aids, as the most efficient means of obtaining the cardinal object—Security.

These measures may be arranged under two heads—natural, and artificial : and while the exercise of

the former requires merely a familiar, and general acquaintance with the nature of infectious diseases ; the application of the latter implies a more critical, and scientific, knowledge of their particular, and relative laws, as well as of the influences of the artificial agents themselves, which physical science can alone supply—common observation suggests, and furnishes the one ; though experience, in its full, and comprehensive meaning, exclusively commands the other. Thus we learn how a knowledge of natural laws enables us to improve our condition, by counteracting evils, of which, but for its possession, we might have remained for ever the helpless victims. In calling in artificial auxiliaries, we augment our actual, and prerogative, power ; and become capacitated for undertakings of self-defence, and self-preservation—of national, and individual welfare—without which aid, our natural means might seem to be hopeless. Hence arises the necessity of forming just conceptions of the evils, and contingencies, that may circumvent us, as well as of the auxiliaries which science suggests—the former are instructive and natural, the latter artificial : these having been brought to light, from the hidden, and prolific, treasury of nature, by the industry and art of man. Of such we are at liberty to avail ourselves at pleasure—bringing them into full play, and force, whenever instances of emergency, and danger, demand their application.

Thus, in the language of a learned, and instructive writer, we are enabled to set in array the resources of nature against herself—and though her laws on the one hand constitute invincible opponents, on the

other they are irresistible auxiliaries—yet a knowledge of these furnishes us with the power, deliberately, of a fore-thought, to devise remedies against the evils that beset us. These, under our present limited means, constitute the very sinews of our strength—arming us with a power of resisting the evil, and embracing the good.

In passing these remarks, and suggesting these familiar means of safety, I am aware that I am only doing what has occurred to the minds of all, who bestow any reflection upon subjects of this description; but it appeared necessary to declare distinctly, and unreservedly, in this place, what seemed to me to be the legitimate inductions, deduced from the whole of the preceding discussion.

Ours are not faults of ignorance, and of commission—but of inattention, and of omission—not that it is meant, by any thing, above said, to assert, or insinuate, that we have wilfully neglected the proffered means, or turned a deaf ear to the voice, and suggestions, of experience; yet, it cannot be said that we have, in a practical, or effectual, manner, availed ourselves of those facts, which have pressed themselves upon our notice, or converted them to those great ends, of which they were susceptible.

The common pestilencies to which our nation is subject—whether they be indigenous, or exotic—are permitted to walk abroad at noon-day, unrestricted, and unarrested, at least, by any authority, armed with sufficient power, to put them down—the very bane of childhood, and youth,—and the disease, now before us, most assuredly is such—is subject to no stronger re-



strait, when it appears as an epidemic, than to that which apprehension, and prudence, suggest, and enforce. It would appear to be necessary, that some national calamity, involving all in one common denunciation, should beset us—that we should all be stricken—to rouse us from that torpidity, which has benumbed our very constitution. Against the Plague we are prompt in arraying all our available force—while a domestic pestilence passes unheeded, and unchecked, by any legal enactment. It has been a familiar saying, that nations never profit by experience—let us then prove by our actions that we are undeserving of such a calumny.

It is more than ever requisite, that it should be understood, how large a portion of those deaths, which occur during the prevalence of Scarlet Fever, as well as of every other infectious disorder, arises from that negligence, and unrestrained intercourse, which is carried on between the diseased, and the uninfected, as well as from that remissness, which is so apparent in the attendants upon the sick ; from which charge, there is reason to fear, we ourselves are not entirely exempt. By these indirect means, much pestilence is propagated, and many lives endangered, which common fore-thought, and circumspection, might have prevented.

Under the head of *natural measures*, I have arranged *separation, and seclusion*, of the infected, and the employment of ventilation, &c. The principle that would suggest, and enforce these means, is considered to arise from simple observation, limited to the object immediately under consideration, “and

assuming only so far the character of science as a systematic adoption of good, and rejection of evil, when grounded on experience carefully weighed, &c.” Thus, I have opposed the measures, included under this head, to those which I have considered artificial ; which enable us to put into action agencies, over which we have no definite control, and which are the result of experience—implying a union of observation and experiment. These have been placed in contrast for no other purpose than for contra-distinction.

To return to the thread of our discourse :—it may be observed, that if the removal of the infected be enforced at the very commencement of Scarlet Fever, and rigid application of the auxiliaries be made, there is every probability of an effectual check being applied to its future progress : if delay be suffered—and it is the character of this disease to be progressive—our prospects of success will become diminished, and the system may prove ineffectual, if not abortive ; as each succeeding case, by furnishing a fresh source of infection, will tend to perpetuate the morbid influence ; and thus may ultimately frustrate all our vigilance and exertion.

By this simple, intelligible, and practicable method, *the Plague* itself has been arrested, as well as other pestilential distempers—the lessons of history, and experience all inculcate this doctrine, and urge the adoption of it, in the manner here suggested, as the mainspring of all our movements. By taking this primary, and most indispensable, step, the effect might be instantaneous, and definitive—as far as related to

the individuals thus separated—who would be placed in a situation more favourable for recovery themselves, and beyond the means of inflicting further mischief upon others, whatever influence they might already have exerted—thus by simply withdrawing the sources of pestilence from their several circles of influence, you are most effectually benefitting them, and securing others from the focus of infection.

These measures are calculated, in their operations—if directed with vigilance, and intelligence, among the lower classes (the most prolific means of disease), and if scrupulously enjoined among the upper circles of society—to diminish, in an incalculable ratio, the frequent recurrence of Scarlet Fever, and must tend ultimately to confine its pestilential influence within comparatively contracted limits.

Should any other specific maladies rage around us—uncertain upon whom they may fall—such measures are equally applicable to their suppression: they are calculated to prepare us to meet a threatened Plague without wavering—with becoming firmness, and confidence—by holding out the shield of protection.

In addition to the means included under the first head, those that next present themselves to our notice are the artificial, or chemical—the most efficacious of which, are the Chlorides of Soda, and Lime. These have been considered the most powerful anti-septics, and dis-infectants. It may be observed here, that as these have been frequently confounded with the chlorates—which belong to preparations different in their chemical composition, and which do not pos-



sess the anti-septic, and dis-infecting properties, in so great a degree; which more exclusively belong to the Chlorides—the non-professional readers, and the public, are particularly warned of the essential difference between these several preparations. The world is principally indebted to Labarraque for these discoveries, “in attenuating the effects of epidemics, and of contagions, &c., and in the preservation, and restoration of health in general.”—*See Appendix, No. 42.*

These anti-putrescents possess the beneficial properties of chlorine, without its noxious and irritating qualities; by the chlorine, which enters into their composition, being given off only in proportion to the presence of aerial, or other substances, for which they have a greater affinity, than for the bases, with which they were previously combined, in the form of Chlorides.—*See Appendix, No. 43.*

The writer of an essay upon these preparations, which deserves the most attentive perusal by every influential member of society, in order that he may communicate good tidings—bearing healing on their wings—to all those around him; who, but for such intelligence, might still have continued ignorant of the blessings that humanity, and art, had prepared for the miseries of mankind—states, “that he had frequent opportunities of observing the beneficial changes effected by the removal of patients, labouring under fever, from their confined and ill-ventilated apartments to well-regulated wards, where every attention could be immediately commanded; yet he has since witnessed a more speedy improvement, by

conjoining the use of the Chlorurets (chlorides) with such general means as those above alluded to, than under any circumstances, without the aid of these powerful agents.”—*See Appendix, No. 44.*

These may be employed for general purposes, as well as for baths, in the proportion of one part of Chloride to thirty of water. The Chloride of Soda has been considered a more powerful dis-infectant than that of Lime, though both possess the valuable property of destroying the most putrid effluvia arising from animal bodies, as well as from vegetable, and other matter, even where these effluvia are diffused to a considerable extent in the surrounding atmosphere.—*See Appendix, No. 45.*

Judging from their anti-septic, and dis-infectant influence, they may be recommended as combining, in an eminent degree, every qualification that fits them for the ends proposed.

Experience, however, has proved that their use does not supersede free ventilation. They may be employed in their diluted form without hesitation, restraint, or consultation ; repeating them every four or six hours, when infection prevails ; not confining their use to the apartment, and wards, of the sick, but generally extending it throughout the house, or hospitals. An important superiority which the Chlorides possess over fumigations by other chemical processes, is that of not exciting any disagreeable, or hurtful, actions, upon the organs of respiration.

In speaking thus strongly in their favour, it must be understood that though my own experience warrants this high recommendation, yet that it does not

authorise me to consider them, as many do, as irresistible, and infallible specifics—as decomposers, and destroyers of the virulent essences of morbid poisons ; though I am not prepared, by experiment, totally to deny their claim to such a character—yet I can confidently offer them as active, and efficient auxiliaries—powerful anti-septics, and indirect disinfectants. Observation, and experience shew their title to these qualities ; and experiment may ultimately confirm the more extended properties, which their sanguine advocates have assigned them. Independent of these chemical powers,—they are available to every rank in society, enabling us to accomplish our ends in the readiest, most economical, and effectual manner.—*See Appendix, No. 46.*

Thus we learn that in the absence of a specific remedy—of a natural, or artificial antagonist—capable of annihilating the pestilence that besets us—while we are denied an infallible cure against the infection of Scarlet Fever for persons immediately within the range of its noisome influence—science holds out an active auxiliary, comparatively efficient ; and though various medicated, and chemical, agencies, hitherto employed, have occasionally proved insufficient, (and it would be unreasonable to anticipate that such means could be exempt from those contingencies, and occasional failures, which have marred the course of other remedial measures, even the most approved,) yet from their sensible result—their palpable advantages—we derive the surest tests of their utility ; furnished with such weapons, let us employ them as



safeguards—as health preservers and securers.—*See Appendix, No. 47.*

It is not my intention to enter into speculation, in this place, upon the manner of their acting—whether they possess the qualities of direct anti-septics, and dis-infectants—whether they act upon the poison itself, or upon the air—whether they decompose the former, or rarify and purify the latter—it being enough for me to content myself with having pursued a more humble course—in having selected from the catalogue of preventives the most efficient samples—which the discoveries of modern chemistry afford, and the preponderating evidence of medical authority has hitherto established.

All our efforts should centre in, and emanate from, this point—here let us take our stand—employing the combined weight of our auxiliary power to the consummation of this project—offer resistance, and restriction, at the very threshold of pestilence, and we may sanguinely anticipate to purify the Augean stable. Our motto should be, *resist at the beginning*—pursuing with uncompromising firmness one leading object, till we have succeeded in securing, if it be in our power, every case within our reach.

It is sincerely hoped that no prejudice, or lukewarmness, will suffer impediments to be thrown in the way—all agree in acknowledging that a case exists, which cries loudly for redress ; a practical proposal has been offered for its redress—if it should not succeed at all times, it cannot tend to aggravate the evil complained of—it must, however, as far as it is possible to anticipate its consequence, be effectually

and extensively, beneficial. In suggesting, or rather seconding, these measures, I am aspiring at no novelty of doctrine—plans of this description have been adopted repeatedly, and *successfully*—trials have been made in every stage of almost every known pestilence, upon an extensive, as well as upon a limited, scale—in private families, and in every public establishment, of youth of every description in society ; and at all times, when the pestilence that walketh in darkness, and the destruction that wasteth at noon-day have visited us. The resources, that are thus placed at our disposal, would quiet unreasonable alarm,—diminish the miseries of the poor,—and afford security equally to those who occupy the higher classes—who would, by a natural re-action, be indirectly rewarded by the very means, which their humanity, and bounty, had suggested, and dispensed, for the diseased, and the helpless.

By thus resisting pestilence in its bud, we are effectually preventing its after dissemination, and ultimately counteracting one of the most destructive evils, against which youth has to contend. If we can neither crush the evil, nor cure it, let us circumvent it—the means are in our hands : let a beginning be made—direct the measures to the seat, instead of the symptoms, of the disease—and we shall ultimately do much towards eradicating the canker, which corrodes the very vitals of society. The *conservative principle*, then, must be the basis upon which the system should rely ; and unless the foundation be laid here, we are building upon sand. Had there been an antidote—had there been balm in Gilead—we should not have



been driven to have converted an auxiliary into a principal. A fair prospect of counteracting this evil is held out, and I have only to express my earnest hope, first, that no unnecessary delay be suffered to supervene in its execution; and secondly, that the whole, and combined measure, and nothing less than the measure, be enforced—whether it be compulsory, or optional, must be determined by higher powers.

Should it be thought that I have treated this subject with more seriousness, and earnestness, than it deserved, I trust that I shall not, on these grounds, be deprived of the forbearance, and indulgence, of my readers, when I assure them, that the only motive in thus pressing upon them my own conviction, has been to convince them of the efficiency of the measures proposed, and of the magnitude of the evil it is calculated to suppress: being fully satisfied of its being a real one, and that it has been universally acknowledged to be in progress, it seemed high time, as well as policy, to endeavour to make the truth intelligible to the public, that they might unite in cordially assisting us in restricting an evil, for which the profession has no cure. Neither is there reason to despair of these measures being met, in a way equally creditable to them, as satisfactory to ourselves, and beneficial to those, for whom it has been especially intended—though it will be learnt, from the tone of some of the preceding observations, that the grounds of my apprehension may exceed hope; yet that I have evinced no despair; for when it is known that there is no specific remedy, there is sufficient hope left to anticipate so material, and effectual a relief from the



adoption of these measures, that ultimately Scarlet Fever may become a rare epidemic in this island.

It is not intended, at the present, to consider the execution of this plan in detail, as our limits do not admit of it—this would appear a presumptuous, and premature step : neither will the separate proofs of what has been asserted, be brought forward, though there is good ground for feeling convinced that whatever has been advanced would be fully born out. Our limits, then, forbid an extension of these remarks ; yet the glimpse, which has been taken, will afford a sufficient general view of their importance, and usefulness—much will depend upon individual, as well as upon national co-operation. It is necessary—using the language of a modern writer—“that these measures must be well understood by the whole community ; every one must have a certain degree of confidence, that his neighbour, whether above, below, or on a level with him, will co-operate with him in keeping matters right.”

The evil has been so bitterly, and heavily, felt and complained of, lately, in every district of England, as to attract the anxious solicitude of the public ; and it is sanguinely hoped, that it will ultimately become an object of serious consideration with the Legislature. It appears indispensably necessary, for the final and complete accomplishment of these *safety-measures*, that they should not be permissive, but compulsory—as general security can only be the result of fixed, and national, regulations. These measures, to be extensively and determinately beneficial, must be founded, it has been presumed, upon the sound principle of

conservation. They will then be found applicable to every prevailing epidemic ; and as only one master pestilence reigns at a time in one place, all infectious diseases may be included under one and the same provision. Without such timely restrictions, the pestilential seed of Scarlet Fever may take such deep root, as to defy every subsequent attempt to eradicate it.—*See Appendix, No. 18.*

Instead of discussing the best mode of executing these measures throughout their several details, I have principally confined my suggestions and illustrations to their expediency and practicability—my attention has been more directed to the end, than to the instrument—this has been my chief object, my prime motive throughout these pages.

We have to cope with an enemy, that shows itself only at particular, and uncertain periods—whose approaches are subtle, and stealthy—who pounces upon its victims, when they are least prepared for its visitations—and which have been any thing but few and far between—occasionally breaking out with a fury equally fearful and untractable—neither does it withdraw its presence, till it has laid all waste before it, leaving a lengthened train of misery in its rear, that too plainly and painfully marks the deadly work in which it has been busy. There are few diseases so appalling to parents as the one now under notice—it has swept away, with the merciless and relentless hand of a destroying angel, their dearest hope and pledges. These facts are too well known, and have been too deeply, and frequently experienced, to require any further comment—they afford so much apprehension, and



supply so much ground of regret, as compel us to acknowledge that Scarlet Fever may be considered the bane of youth.

Before taking leave of this part of the subject, I shall avail myself in this place, of saying one word respecting the details of these measures—which exclusively relate to their execution—viz., that these should be considered as so many items in the general account, furnishing desiderata for future examination, and discussion—they are, in a comparative sense, secondary, though vitally essential to its final accomplishment.

It has fallen to my lot to shew cause why a rule should be granted—having done this, my occupation is gone. It remains for others to say whether they are inclined to adopt the whole, or only part, of the plan—the application having been made—the cause advocated—it must now be submitted for its final issue to a higher tribunal—yet it is still for the public to remember, “that it is neither humanity, nor policy, nor philosophy, to neglect what is within our reach, because we despair of obtaining all the good that might be desired.”

I have now accomplished the task I had assigned to myself; and the reader, in judging of the manner in which the design has been executed, will, it is hoped, bear in mind the particular intention, and views, with which it was undertaken—the difficult and intricate nature of the subject, and the necessary caution to be observed in the general handling of the point in question; especially when its dependencies, and bearings, upon physiology came under consideration,



the introduction of which has been carefully avoided, whenever the necessary illustrations could be derived from a more familiar course.

It has often been declared that scientific subjects should only be addressed to, and can only be judged of, by scientific men : this, as a general proposition, might be true ; but when there are sufficient grounds for believing that there are certain opinions current in society, as well as among some members of the profession, upon the nature of infectious, and pestilential, disorders, which would, upon minute examination, be shewn to be founded in error, and which are inseparably connected with the welfare and health of mankind, the more urgent the necessity and duty become that some one should attempt to remove these evils, if remedies were attainable ; for to allow any evil, (and let no one think that this expression is overcharged or misapplied) which we may possess the means of controlling, to take its course unnoticed and uncontrolled, would afford in any, especially in the present, instance, fair ground for preferring a public charge, against the members of the profession, of perilous neglect, and apathy. I say “perilous,” because the false security, into which the public may be lulled, by allowing an error of this nature to go unexposed, whenever a plague or pestilence prevails, might endanger the lives of thousands.

That no just cause of professional reproach may exist, and that more correct views may be entertained by society, upon a subject that so vitally concerns the security of individuals, and of nations, this humble effort has been made. It may be considered by some

as unprofessional to address the public upon a scientific and abstract subject : in self defence I may be permitted to remind the reader, in language lately used, “that there are points in medicine, forming the debateable land between technical and general knowledge, which few, who have attained to half the years allotted to our sojourn here, have not been found to make the subject of anxious thought.” If there be any point, that has formed this debateable land in medicine more frequently, and more notoriously, than another, it is that of pestilential disease. Another reason may be advanced, of a still stronger nature, viz. : that the point in question comes home to us all. General information is now so much more diffused than formerly—owing to that impulse which has pervaded all ranks, and which has so signally extended the boundaries of knowledge in all directions, as to preclude the possibility of the subjects under discussion being uninteresting or unintelligible, although they are, in many respects, of an abstract and scientific nature—that it appeared to my mind the better way to place distinctly before my readers, in a familiar and popular form, the immediate subject under consideration ; leaving it to their intelligence and judgment, should they be inclined to examine this highly interesting subject for themselves. When I consider how much more might be advanced, in illustration of the principal point to be established, while I feel sensible that full justice has not been done to this part of the subject, and am convinced of the inadequateness of the representation I have offered, I still entertain the hope, though all the facts belong-



ing to it are not brought forward, that sufficient illustrations from analogy have been advanced, if attentively examined and considered, without prejudice, or partiality, to satisfy any reasonable mind that the evidence they afford may warrant the probable theory which they were designed to establish.

It would be unreasonable to expect mathematical demonstration upon a subject which does not admit of it ; yet, if it be granted (although there be not demonstrative, there is presumptive proof) that the primary qualities, of morbid poisons, are so inseparably combined with their elementary essence, as to induce the belief of their indissoluble union, it follows as a necessary consequence, that their several, and peculiar, effects, or sensible qualities, would bear the same relation to their primary qualities, and essences, as integral parts do to the whole ; thus constituting sameness and identity, as well as distinct and permanent species.

Admit that morbid poisons contain real essences, by the qualities of which the species of each have been distinguished, and it would surely be as impossible—granting quality to be inseparable from its essence—to find different qualities in any two individuals of the same species, as it would be to find different properties in two circles, or two equilateral triangles. It is the perceptible, and peculiar efficacy, that determines any individual disease to this or that species. Although we have no distinct and clear ideas of the constitution of these morbid essences, or rudiments, which are themselves impalpable, and imperceptible ; yet, from their sensible qualities, it is not repugnant



to reason, or analogy, to infer, that their species may be as strongly marked, as much separated, and diversified one from another, as the species of sensible things are distinguished one from another, by their sensible qualities.

The influences, arising from such a principle, would be found to extend beyond the limits of primary qualities, and afford a solution of many of those phenomena, which are observed during their active, and morbid operation in the animal economy. Hence we might in time learn by what peculiar means, and powers, they excite specific action, as well as the certainty with which their reproduction, and preservation of species is effected, and secured. It is to this principle that they are chiefly indebted for their capacity of resisting the most destructive agencies in nature : they become, by this means, proof against the inclemencies of season, and varieties of climate, and the powerful heat of a tropical sun ; as well as against the assimilating functions of animal life. They have evinced no disposition hitherto to submit to any positive restraint, whether it be a specific, or an antidote. They appear to be controlled by laws peculiar to their own class ; possessing very few of those properties which distinguish animal, and vegetable poisons. For mankind, solely, they were, in all probability, created ; hence all their operations, and phenomena relate to, and centre in, the human frame.

This mode of arguing from points established—of advancing from data, highly probable, to conclusions, which would otherwise have been less obvious—must necessarily tend to obviate, and eradicate, those in-

numerable errors, and discrepancies, in which mankind have been involved, from the earliest discussion of these mysterious phenomena. By resting upon plain facts, and substantial observation, a more rational and probable theory may be constructed, than by indulging in visionary speculation. By adopting this rule, the mind of professional, as well as of non-professional, men, may gradually become emancipated from those doctrines of spontaneous, and equivocal generation, to which they have been so strongly biassed of late : and by abandoning these sceptical modes of reasoning, they may ultimately be directed into a more rational, and less ambiguous channel. Thus, more consistent inferences might be established, in conjunction with those deducible from analogy, which have been found so wholesome, and efficient, in other investigations, and might, in the end, prove equally successful on the topic of our present investigation.

From the tenor of the preceding remarks, it will be seen, that the writer totally dissents from the doctrine of spontaneous, and equivocal, generation, as concerned in the propagation of morbid poisons ; and, indeed it may be added, in any other of the works of the creation, where constancy in species is observed, which implies procreation from a parent stock. Though deeply impressed by the probability of these facts, and being fully assured, that the excluding from consideration the means, by which Providence guides the material, and inanimate world, would be opening a door to the introduction of a wild credulity, as derogatory to supreme wisdom, as disgraceful to those, by whom it would be entertained ; yet, he begs it to be

distinctly understood, that he is equally opposed to that confident, and unwarrantable belief, which, by attributing all the operations of nature to the immediate influence of Providence, would presumptuously attempt to solve every difficulty, and silence every doubt, that might arise during the discussion of topics of this nature.

It has been said that the book of nature is open to, and may be read by, every one, yet, that it contains more difficulties, and mysteries, than any known creed, and many more, than philosophy ever dreamt of. In accordance with this belief, let us not be tempted to scrutinize too minutely those phenomena, which the wisest, and best, have, hitherto, considered inscrutable, and for which the material world affords no testimony. These unsearchable difficulties, which everywhere present themselves to our notice, whenever we examine the works of nature, should teach us other lessons, than those of arrogance, and presumption : they forcibly remind us, in language sufficiently intelligible, that our faculty of comprehension is fixed, and limited ; that whenever it labours to pass those boundaries, its powers become either paralysed or extinct : and we lose the object of research, by confiding in our own, rather than, in super-natural aid : thus making shipwreck of our faith, amidst the shoals and quick-sands of doubt, and incredulity.

Nevertheless, the subject itself presents so many difficulties—is of so complicated a nature—so subtle in its relations—and so involved in its operations with other invisible agents, as to preclude every reasonable



hope, that the main points, which I have been advanced, would be admitted by every one, who may be disposed to peruse these pages.

Fully convinced that all the productions of nature have a fixed designation, however small, and obscure, their origin ; and that they proceed by a gradation certain, though slow—often inscrutable, yet ultimately palpable, and distinct ; and that these processes, though invisible, are always destined to the accomplishment of some given end—I cannot close these observations on the origin, progress, and result of morbid poisons, more appropriately, than by availing myself of the language of that minute, and discriminate, observer of nature—Paley :—“ Having received a beginning, their future progress was committed to natural means, &c., the seed being sown was left to vegetate, the leaven being inserted was left to ferment, and both according to the laws of nature ; laws nevertheless disposed and controlled by that Providence, which conducts the affairs of the universe, though by an influence inscrutable, and generally undistinguishable by us.”

In full assurance of the truth, and force, of these sentiments, I still cling to the hope, that my labour has not altogether been in vain ; and sincerely trust that the reader will be ultimately convinced, that there is strong ground for presuming, that the origin of morbid poisons is by express appointment ; and that their propagation, and appropriation, are directed by laws, definite, and inconvertible, as they are inscrutable.

## APPENDIX.

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No. 1. The reader is requested to turn to the brief Historical Sketch, page 52.

See Article xi., UPON CONTAGION AND QUARANTINE, IN THE QUARTERLY REVIEW, No. liv., Oct. 1822, p. 525.—“It is shewn (says Dr. Maclean) by conclusions deduced from undeniable premises, that it is impossible epidemic diseases should ever depend upon contagion (infection); and he goes on to state, that ‘the prevalent notion of contagion being an inherent quality of pestilential fever, is absurdly derived from a popish rumour of the sixteenth century;’ while, on the other hand, one of the most strenuous and able supporters of the opposite doctrine, Dr. Granville, maintains, ‘that the disease called Plague is never epidemic; that *it is independent of all influence of the atmosphere*; that it commits its ravages when no possible cause of unhealthiness exists, and is neither checked nor promoted by the south or north winds, by winter or summer, by an elevated or low situation.

“Between these extreme points, others take their stand at different distances; some of them more, and some less readily admitting the principle of contagion as connected with plague, but all denying its abstract power and independent essence.”

No. 2. DR. HEBERDEN’S COMMENTARIES, p. 18.—“This distemper is sometimes so slight as to require no remedies, and sometimes so violent as to admit of no relief. From the foregoing description of Scarlet Fever, and malignant sore throat, it seems highly probable that they are both names of the same distemper, with some little variety in a few symptoms; and this opinion is confirmed by our finding that they are both epidemical at the same time. Even in the same family, where a number of children have been ill, either together, or immediately after one another, some have had the distinguishing symptoms of Scarlet Fever, others of the malignant sore throat.”

The same opinions have been declared by Dr. Binns, who has written upon Scarlatina; by ——— Rosenstein, on Diseases of Children, p. 61; and by Dr. Withering, p. 5.

No. 3. DR. WILLAN, p. 281, 4to.—“All of these varieties proceed from the same source of contagion is evident, because under the same roof in large families some individuals have the disease in one form, some



in another, about the same period."—See *Rosenstein, on the Diseases of Children*, chap. 16; *Memoirs of Medical Society*, vol. iii., p. 358; compare *Withering*, p. 5; and *Dr. Heberden's Com.*, p. 25.

NO. 4. QUARTERLY REVIEW, lxxxv., p. 188.—“But the administration of this world, it may be said, is carried on according to general laws. Still there is much on foot to which those laws do not seem to apply—faults as it were (to use a miner's phrase) in the constitution of things. What are the laws, for instance, by which a hurricane, or a pestilence, pounces upon mankind, scourging one place, and sparing another; so hard to be reduced to any principle; as to be called (what is another name for our utter ignorance of their nature) accident? May it not be that time and seasons proceed by rules prescribed, till some accumulation of inconvenience requires the interposition of a hurricane, or a pestilence, or a famine, and still that the interposition itself occurs according to a general law too, not less to be considered as an item in a system of expedients, implying defects, or effort, unworthy of the contriver, since to change implies no more of this than to create,—for if there was a defect before the change, so must there have been before the creation, creation itself being a change; and if an effort is required to alter, so it must have been to produce—but rather as the natural effect of causes set at work from the beginning. But (as we have had frequent occasions to remark in the progress of this argument) nothing is more usual to see events in the natural world made subservient to moral ends; indeed so usual, that it may be doubted whether every individual event is not intended to produce finally some moral purpose.”

PAYLEY in his *NATURAL THEOLOGY*, p. 50, says, “The confidence which we place in our observations upon the works of nature, in the marks which we discover of contrivance, choice, and design, and in our reasoning upon the proofs afforded us, ought not to be taken, as it is sometimes attempted to be done by bringing forward to our view our own ignorance, or rather the general imperfection of our knowledge of nature. Nor in many cases ought this consideration to affect us, even when it respects some parts of the subject immediately under notice, &c. If we perceive a useful end, and means adapted to that end, we perceive enough for our conclusion; if these things be clear, no matter what is obscure.”

VIDE BACON'S *NATURAL HISTORY*, 913.—The aged are seldom attacked with the Plague; Pliny was of the same opinion. Dr. Hancock has collected many interesting and instructive instances of exemption during pestilence, from which the following have been selected:—

“It may be gathered from Sydenham,” (pp. 81 and 485) that this was the case in London. “Although the young and the strong are more especially the victims (of Plague,) yet there is a limit; for it would appear from the history of many Plagues, *that infants at the breast are but little liable; but when their supplies are cut off, hundreds of this class perish.*



In the Plague at Manchester, infants escaped; and at Moscow, very few under two years old appeared to die from the disease.—*See Short and Mertens.*

The Protomedico at Malta says, “several infants drew milk from their mothers from the time they were affected with the Plague to the period of death, without the former taking the disease.”—*Dr. Maclean, p. 11, 28.*

Dr. Lafuenti says of the epidemic fever at Medina Sidonia, in 1801, “It attacks every individual in the different houses, except the children at the breast.”

In a Plague at Basle, only Swiss, no Italians, nor French, nor Germans, were affected. And at Hafni, in Denmark, during a dreadful pestilence, all strangers, as English, Dutch, and Germans, escaped; notwithstanding they lived promiscuously amongst the infected in infected houses.—*Diembroeck*

“It was very remarkable,” says the author of Dr. Mead’s discourse explained, “that there was not a British subject in Dantzic received any hurt, while thousands of the natives fell on the right hand, and tens of thousands on their left.”

When the British army was in Egypt, we are informed by Sir Robert Wilson, the natives in many of the villages had the Plague, but did not communicate it in a single instance to the soldiers, though the latter did not object to hold intercourse with the former, having even plague-sores upon them, in the market. And again, we are informed of a fact somewhat the reverse of this, by Assalini: for “when the French army that marched towards Acre, having been subjected in the route to great privations and inclemencies of the weather, was attacked by the disease, the Egyptians and Syrians were not infected by the French, with whom they held continual intercourse. These had slept upon the damp soil of Ramla, after being often drenched with rain by day and by night; paludal exhalation were conveyed into the camp, and their only subsistence at Jaffa was rice and bad bread.” The reader will do well to consult the admirable work of Dr. Hancock throughout.

No. 5. In speaking of the presumptive and fatal indifference of the Turks, and the mischievous effects of their fatalism, a writer upon the Plague observes, that “they possessed predestinating notions, and went unconcerned into infected places, and conversed with infected persons, by which means they died at the rate of 10 and 15,000 a week, when the European and Christian merchants, who kept themselves retired and reserved, generally escaped contagion.”

Can a more instructive, or convincing evidence be required, to prove the efficacy of human agency, and the advantages of vigilance and precaution, while a noisome pestilential epidemic rages, seeking whom it may devour, than has been furnished by the fact just cited?

No. 6. DR. WILLAN, 4to. p. 395.—“ Since we submit to these strict and severe laws, in order to guard against the introduction of Plague, we cannot, I think, consistently oppose some necessary regulations with respect to other contagious and fatal disorders. The reports of the institution for the cure and preservation of contagious fevers in the Metropolis, show how much may be accomplished by a persevering attention to the subject. This society, by *removing persons first infected to a convenient house*, and by ventilating, cleansing, and fumigating the apartments they had occupied, &c., was enabled within three years to suppress the Typhus Malignant Fever in several adjoining parishes, where it had before annually produced a considerable mortality among the labouring poor.”—See *Reports on Diseases in London*, p. 229—285.

“ Some restraints imposed with regard to the sources of contagion, and enforced by authority, might also prevent the diffusion of the Scarlet Fever in London, in other cities, in our sea-ports and considerable manufacturing towns, from which it is often conveyed in various directions through the country. A specific mode of accomplishing so desirable an end need not be here detailed. The successful exertion made in different parts of Europe, to prevent the communication of the Small Pox, and pestilential disorders, has been very successful; it is, therefore, reasonable to conclude that similar efforts might finally extirpate the Scarlatina, a disease which has so long been the bane of schools and academies.”

No. 7. Dr. Hancock, speaking of Dr. Maclean, who has written upon Plague, says, “ When, however, Dr. Maclean’s confidence in his own opinions led him so far in the line of direct proof as to brave the destroyer in its den, the pest-house of Constantinople; though we may applaud his resolution as well as his sincerity, and give him due credit for the ingenuity with which he seeks to explain the fact according to his hypothesis; we must, I think, reasonably doubt his principles, when we find that, by his own statement, he was attacked with this non-contagious malady on the fifth day after he entered that nursery of pestilence.”

SEE DISTINCT NOTIONS OF THE PLAGUE, 1722—INGAM ON PLAGUES—in which he states “ Plague no contagious disease.”

SEE MR. CHARLES SALT’S WORK ON THE INOCULATION OF MORBID POISONS.—“ It is said that there are several German Physicians now residing at Constantinople, who, considering themselves secure from future attacks of the Plague, from having been inoculated for that disease, attend the hospitals in which persons are placed affected by that dreadful malady. One, however, is reported to have lost his life by having become a second time the subject of this disease.”

“ The writer has himself met with a gentleman, upon whom he can rely, just returned from Armenia, Syria, and Asia Minor, who confidently states that the Plague may be communicated by inoculation, but that deaths have been occasioned by it among persons who made the experi-



ment under the full conviction that the disease was not communicable by such an operation.

NO. 8. PAYLEY'S NATURAL THEOLOGY.—“ Gravitation, Electricity, Magnetism, though constantly present, and constantly exerting their influence ; though within us, near us, and about us ; though diffused throughout all space, or penetrating the contexture of all bodies, with which we are acquainted, depend upon substances and actions, which are totally concealed from our view.”

HERSCHEL, ON NATURAL PHILOSOPHY, p. 193.—“ The agents employed by nature to act on material structures, are invisible, and only to be traced by the effects they produce. Heat dilates matter with an irresistible force, but what heat is, remains yet a problem. A current of electricity passing along a wire moves a magnetized needle at a distance ; but except from this effect, we perceive no difference between the condition of the wire when it conveys, and when it does not convey the stream ; and we apply the terms current, or stream, to the electricity only, because in some of its relations it reminds us of something we have observed in a stream of air or water. In like manner we see that the moon circulates about the earth ; and because we believe it to be a solid mass, and have never seen one solid substance revolve round another within our reach to handle and examine, unless retained by a force, or united by a tie, we conclude that there *is* a force, and a mode of connection, between the moon and the earth ; though what that mode can be, we have no conception, nor can imagine *how* such a force can be exerted at a distance, and with empty space, or at most an invisible fluid between.”

Again (p. 149)—“ Here, then, we see the great importance of possessing a stock of analogous instances, or phenomena, which class themselves with that under consideration, the explanation of one among which may naturally be expected to lead to that of all the rest. If the analogy of two phenomena be very close and striking, while, at the same time, the cause of one is very obvious, it becomes scarcely possible to refuse to admit the action of an analogous cause in the other, though not so obvious in-itself. For instance, when we see a stone whirled around in a sling, describing a circular orbit round the hand, keeping the string stretched, and flying away the moment it breaks, we never hesitate to regard it as retained in its orbit, by a *force* directed to the centre ; for we feel that we do really exert such a force. We have here *the direct perception* of the cause. When, therefore, we see a great body like the moon circulating round the earth, and not flying off, we cannot help believing it to be prevented from so doing, not indeed by a material tie, but by that which operates in the other case through the intermedium of the string,—a *force* directed constantly to the centre. It is thus that we are continually acquiring knowledge of the existence of causes acting under circumstances of such concealment, as effectually to prevent their direct disco-



very.”—“The *force* of magnetism becomes known by the deviation produced by iron in a compass needle, or by a needle leaping up to a magnet held over it, as certainly as by that adhesion to it, when in contact and at rest, which requires force to break the connection; and thus the currents produced in the surface of a quantity of quicksilver, electrified under a conducting fluid, have pointed out the existence and direction of forces of enormous intensity developed by the electric circuit, of which we should not otherwise have had the least suspicion.”

NO. 9. SIR ASTLEY COOPER'S MANUSCRIPT LECTURES ON POISONS.—“Poisons are derived from five sources, viz.: there are those from the *animal* and *vegetable kingdom*—there are the *mineral* and *chemical poisons*—and another, furnished by man himself, is called *morbid poison*. You will find such a difference with regard to the effect of morbid poisons, when compared with the others, that you will speedily relinquish any opinion you might have formed respecting a supposed reciprocity of action between them.”

“In tracing the operations of poisons, we find some of them affect the vascular system, others the nervous, while many poisons affect both the nervous and vascular systems at the same time. In looking at poisons from many animals, for example, we find the first action in the arterial system, while the influence of others evidently begins in the nerves.

“The poison communicated by the viper and rattlesnake attacks the arterial system first; that from the bite of a rabid animal influences the nervous system first; but ultimately, in these cases, both become affected.”

“With regard to the vegetable poisons—all of these act on the nervous system. Mineral poisons destroy, some by arterial, and others by nervous influence; lead acts directly upon the nerves, and not upon the arteries; arsenic, muriate of barytes, and oxymuriate of mercury, produce violent inflammation.”

“There are some poisons which are innocent when taken into the stomach, but which prove deleterious when applied to the lungs, or to an abraded surface; thus carbonic acid is continually swallowed with fermented liquors with impunity, and the poison of the viper, and small pox matter, may be taken or conveyed into the stomach without any visible effect;\* whilst inspiring carbonic acid gas kills. The poison of the viper inserted into the flesh often proves fatal, and small pox communicated by inoculation produces disease.”

“There are a set of poisons which act upon man only, or animals—and often upon one genus of animals—these are called relative; thus aloes is poisonous to wolves; the phellandrium aquaticum kills horses, while oxen devour it greedily, and with impunity.”—*Gallery of Nature and Art*.

\* Dr. Rush made this experiment upon a negress convict in America.

Mr. Brodie's experiments shew that spirits, when taken into the stomach, produce their effects upon the brain, not by being absorbed, but in consequence of the sympathy which exists between these organs by means of the nerves.

"Opium administered in considerable quantity destroys life, by producing apoplectic symptoms. Iodine, which is now much employed in enlargement of the glands, in the form of hydriodate of potash, is a very active poison."—*See Sir Astley Cooper's Lectures, in the Lancet, on Poisons.*

Alkohol, oil of bitter almonds, the juice of aconite, the empyreumatic oil of tobacco, the woorara, titunas, upas, &c., act upon the nerves. The oil of the cherry laurel, and prussic acid, destroy by means of the nerves.

Vegetable poisons are more immediate in their action than morbid—much variety in the latter—some produce their constitutional effects in three days, while others have been known to lie dormant in the human frame for 364 days.—*Vide Sir Astley Cooper's Lecture on Poisons, in the Lancet—Dr. Babington's Medical Researches.*

"The same difference in animal poisons. The sting of the wasp, hornet, &c. excite instantaneous inflammation by acting upon the arteries—while the bite of the viper, &c., act first upon the nerves, and secondarily, upon the arteries—hence paralysis and inflammations ensue."

"Tobacco is highly poisonous—life has been destroyed by thirty grains being used as an injection—it has destroyed life when applied in the form of an extract to the head in ring-worm—death has not been known to occur after using the smoke in the form of an injection."

"That opium does not act direct upon the arteries is shewn by the following morbid account:—A reddened appearance of the stomach is noticed upon dissection after death by opium, but no inflammation. This fact is worthy of notice, in guiding our opinions upon death produced by opium, in a Court of Justice. No one is authorised to say that death is produced by a vegetable poison, unless he find a vegetable poison in the stomach, or is fully satisfied that such had been administered in sufficient quantities to have produced death."

"Opium applied externally to an extensive sore on the skin has occasioned death—when it is injected into the veins of a dog, or any other animal, it quickens the pulse to such a degree, as to prevent its being reckoned—these effects are followed by convulsions and death."—*Sir A. Cooper's Lectures.*

The prussic acid is a most violent and active poison—its base is a compound of azote and carbon. It is called hydro-cyanic—hydrogen being its acidifying principle. One drop applied to the eye of an animal produces sudden death. When applied to the tongue of a dog, the same effect follows. The muscles of an animal thus destroyed discover no traces of irritability, neither does the blood coagulate—it leaves no other traces of its influence than a strong smell of bitter almonds.

Acetate of morphine, is a hazardous medicine—and from our present



knowledge of its effects cannot safely, and with confidence, be substituted for opium.

“ The action of morbid poisons is various—some act upon the arteries, some on the nerves. In Typhus fever, the virus first affects the nervous system, producing great depression of the mental and bodily powers, through which ultimately persons are destroyed.”

“ Many morbid poisons act directly upon the arterial system ; as, for example, small pox : here inflammation is first produced, which terminates in the secretion of matter capable of propagating the disease—other morbid poisons, as measles, first affect particular parts, and afterwards the entire system. The affection of measles is easily communicated, and the infectious virus so subtile, that it readily floats in the air ; it is of so infectious a nature, that it can be communicated by means of the atmosphere to persons at a great distance. The most infectious disease is that called the mumps ; if this disease makes its appearance in a school, more than half the children will become affected by it—this particularly attacks the glands of the throat.”

“ Poisons diminish in effect by repetition ; opium, therefore, if given for any considerable time, will lose its influence, if the quantity be not increased. The same is equally true of many other articles of the *Materia Medica*. Now morbid poisons, by repetition, likewise lose their influence. If hospital fever should attack an individual a second time, which it seldom does, it will be slight, and its effects insignificant, compared to those in the first instance. The same thing happens in Searlatina, when it occurs a second time, the fever being much milder—the excitement in such cases is mitigated, and much less severe. Some morbid poisons only act for a time, others permanently, upon the human frame.”—*From the same Authority.*

Mr. Hunter observes, when treating of morbid poisons, “ *There are some parts more susceptible of specific disease than others. Poisons take their different seats in the body, as if they were allotted to them. These differences may arise from the nature of the parts themselves, or from some regular circumstances which must act as exciting causes. The qualities of matter is always according to the nature of the parts which produce it ; and whatever specific qualities the parts may have besides, the matter has also this specific quality : hence we have small-pox matter from small-pox pustules, and cancerous matter from cancerous sores,*” &c. &c. Alluding to peculiarity of constitution, Mr. Hunter remarks, “ This is well illustrated in specific disease ; for instance, in the small-pox. The small-pox produces a fever, viz. a disturbed action, joined with the specific, and although this action is produced by the same poison in two different persons, yet the one shall be the true inflammation, and the other the putrid, the erysipelatous, &c. &c. Now the same poison can have but one mode of irritating, abstracted from its poisonous quality, and this one mode produces fever ; and it can also have but one mode of irritating in respect



of its poisonous quality, but that fever, abstracted from its poisonous quality, will be according to the *nature of the constitution* at the time, the poison being capable of producing nothing but a fever joined with its specific poison, and that *specific quality takes place equally on every kind of constitution*, the poison itself having no more power of affecting the constitution in one person *differently* from that of another, it can only *act in a greater or less degree, according to the susceptibility of the person for such irritation.*—p. 258, 4to., *Fundamental Principles of Inflammation.*

The same author, p. 226, when treating of the different causes which increase and diminish the susceptibility for inflammation either in the whole body or in part, says, “Susceptibility may be said to have two causes, the one original, the other acquired. The original constitutes a part of the animal economy, and is probably inexplicable.”

“Of the acquired it is probable that climate, and modes of life, may tend considerably either to diminish or increase the susceptibility, &c.” Again, “strength and weakness are the opposites of each other, and therefore have very different effects in disease.”—p. 261. “There are many constitutions which have a tendency to specific diseases, and when injured by fever, or any constitutional complaint, readily produce the specific inflammation in such parts of the body as have the greatest susceptibility from specific action,” &c. “Besides the constitution producing such effects, there are many parts of the body which have a greater tendency to some specific diseases, than the constitution in general; this is the case when a scrophulous and cancerous disposition exists, the former attacking the absorbent glands, the latter distinct secreting glands.”

“Diseases, however, of the same specific nature, not only vary in their visible symptoms or actions, but in many of those that are invisible, arising probably from peculiarities of constitution, and other causes, &c. This we see in poisons; the peculiarities, therefore, in the disease, must arise from a peculiarity in the constitution, and not from the cause of the disease. In specific inflammation, the matter secreted is precisely similar to that which produced the morbid action; it is not in the least affected by the constitution. Thus whenever a specific disease attacks either the suppurating surface, or the constitution, these processes of nature are destroyed, and the very reverse take place.”—*See Adams on Morbid Poisons—Orphila on ditto.*

SEE JAMESON ON THE CHANGES OF THE HUMAN BODY, &c., p. 151.—“Certain *hereditary tendencies* of constitution, and peculiarities of temperament, derived from parents, render many persons susceptible of different specific diseases,” &c. In another place he observes—“That the changes of age produce certain conditions of the organs, which render the body liable to *distinct and appropriate classes of diseases*, in the different periods of life, &c.; but how these natural changes become the predisposing causes of disease, is a subject but little attended to. It is owing to the changes of age, that the generality of diseases are common to the

species all over the world, and that most of them have appeared, without any essential difference of character, since the time they were accurately recorded by Hippocrates, to the present day. That diseases were the same in his days, and in his country, as they now appear in these islands, are proved by many of his aphorisms.”—*Hippocrates, sect. iv., Aphorism : 24 ad 31.*

No. 10. SIR A. COOPER’S MANUSCRIPT LECTURES ON POISONS.—“Dr. Fordyce believed that, if the poison was diluted, its influence would be much less severe; accordingly he tried some experiments, attempting to prove this, and exceedingly diluted the poison with water; the effects, however, were precisely similar to those excited by the poison in its concentrated state—he, therefore, relinquished his opinion as untenable. This, then, is a remarkable difference between vegetable and morbid poisons; the first produces effects in proportion to the quantity taken, whereas in the latter the quantity of poison makes no difference in its particular specific action; but *this is regulated by the peculiar condition of the patient.*”

No. 11. “PRIMARY QUALITIES.—Qualities thus considered in bodies are, first, such as are utterly inseparable from the body, in what estate soever it be; such as in all the alterations and changes it suffers, all the force can be used upon it, it constantly keeps; and such as sense constantly finds in every particle of matter, which has bulk enough to be perceived, and the mind finds inseparable from every particle of matter, though less than to make itself singly be perceived by our senses. Take a grain of wheat, divide it into two parts, each part has still solidity, extension, figure, and mobility; divide it again, and it retains still the same qualities; and so divide it on till the parts become insensible, they must retain still each of them all those qualities. For division (which is all that a mill, or pestle, or any other body does upon another, in reducing it to insensible parts) can never take away solidity, extension, figure, or mobility, from any body, but only makes two or more distinct separate masses of matter of that, which was but one before: all which distinct masses, reckoned as so many distinct bodies, after division make a certain number. These I call *original and primary qualities,*” &c.—*Locke, pp. 112 and 118.*

Subject the virus of morbid poisons to the same divisions, and subdivisions, till its parts become insensible, and float in the air,—would not a similar result occur? viz., each invisible and impalpable particle of virus retaining its primary quality.

HERSCHEL, ON NATURAL PHILOSOPHY, p. 40.—“The researches of chemistry have shown that what the vulgar call corruption, and destruction, &c., is nothing but a change of arrangement of the same ingredient elements, the disposition of the same materials into other forms, without the



loss or actual destruction of a single atom ; and thus any doubts of the *permanence* of *natural laws* are discountenanced, and the whole weight of *appearances* thrown into the opposite scale. One of the most obvious cases of apparent destruction is, when any thing is ground to dust, and scattered to the winds. But it is one thing to grind a fabric to powder, and another to annihilate its materials ; scattered as they may be, they must fall somewhere, and continue, if only as ingredients of the soil, to perform their humble but useful part in the economy of nature. The destruction produced by fire is more striking : in many cases, as in the burning of a piece of charcoal or a taper, there is no smoke, nothing visibly dissipated, and carried away ; the burning body wastes and disappears, while nothing *seems* to be produced, but warmth, and which we are not in the habit of considering as substances ; and when all has disappeared, except perhaps some trifling ashes, we naturally enough suppose it is gone, lost, destroyed. But when the question is examined more exactly, we detect, in the invisible stream of heated air which ascends from the glowing coal, or flaming flax, the *whole* ponderable matter, only united in a new combination with the air, and dissolved in it. Yet so far from being thereby destroyed, it is only become again what it was before it existed in the form of charcoal or wax, an active agent in the business of the world, and a main support of vegetable and animal life, and is still susceptible of running again and again the same round, as circumstances may determine."

The same writer observes, (page 37) "The Divine Author of the universe cannot be supposed to have laid down particular laws, enumerating all individual contingencies, which his materials have understood and obeyed—this would be to attribute to him the imperfections of human legislation ; but rather, by creating them, endued with certain fixed qualities and powers, he has impressed them in their origin with the *spirit*, not the *letter*, of his law, and made all their subsequent combinations and relations inevitable consequences of this first impression, by which, however, we would no way be understood to deny the constant exercise of his direct power in maintaining the system of nature, or the ultimate emanation of every energy which material agents exert from his immediate will, acting in conformity with his own laws." Again, in page 42 :—"Now, this absolute indestructibility of the ultimate materials of the world, in periods commensurate to our experience, and their obstinate retention of the same properties, under whatever variety of circumstances we choose to place them, however violent and seemingly contradictory to their natures, is, of itself, enough to render it highly probable that time alone should have any influence over them. All that age or decay can do, seems to be included in a wasting of parts, which are only dissipated, not destroyed, or in a change of sensible properties, which chemistry demonstrates to arise only from new combinations of the same ingredients. But, after all, the question is one entirely of experience : we cannot be sure, *à priori*, that the laws of nature are *immutable* ; but we can ascertain, by enquiry, *whether they*



*change or not*, and to this enquiry all experience answers in the negative," &c. "But the laws of nature are not only permanent, but consistent, intelligible, and discoverable with such a moderate degree of research, as is calculated rather to stimulate than to weary." "But to ascend to the origin of things, and speculate on the creation, is not the business of the natural Philosopher. An humbler field is sufficient for him in the endeavour to discover, as far as our faculties will permit, what *are* these primary qualities originally, and unalterably, impressed on matter, and to discover the *spirit* of the laws of nature, which includes groups and classes of relations, and facts from the *letter* which, as before observed, is presented to us by single phenomena; or if, after all, this should prove impossible; if such a step be beyond our faculties, and the essential qualities of material agents be really occult, or incapable of being expressed in any form intelligible to our understandings, at least to approach as near to their comprehension as the nature of the case will allow," &c.; a question then arises, "whether the laws of nature themselves *have* that degree of permanence and fixity which can render them subjects of systematic discussion; or whether, on the one hand, the qualities of natural agents are subject to mutation from the lapse of time. To the ancients, who lived in the infancy of the world, or rather, in the infancy of man's experience, this was a very rational subject of question, and hence their distinctions between corruptible and incorruptible matter, &c.; but to us, who have the experience of some additional thousand years, the question of permanence is already, in a great measure, decided in the affirmative."

Bacon, speaking of the discovery of forms, observes, "the *form* of any nature is such, that where *it* is, the given nature must infallibly be. The form, therefore, is perpetually present; ascertains it universally, and accompanies it every where. Again, this form is such, that when removed the given nature infallibly vanishes. Lastly, a true form is such as can deduce a given nature from *some essential property*."

"Having found, by experience, that every thing we see has some cause of existence, we are induced to ascribe the constant circumstance of a substance and its properties to some necessary connexion between them: but, however strong the feeling may be, which leads us to believe in some close bond, we can only trace, in this notion of necessary connexion, the fact of certainty and universality of concurrence."—*On the Study of Physiology*.—Lawrence.

No. 12. Those who are disposed to attribute the mild variety of small pox, after inoculation, to a consequent, and permanent, modification, or change in the quality of the variolous essence, or seed, do not seem to have drawn their inferences from the ultimate result of observation, and experiment, which should be exclusively advanced as the proper, and legitimate tests, by which this question can be decided. It is true, that a mild *variety* is generally produced by inoculation in small pox; but this

is surely no proof that the specific quality of the poison has undergone any change. The *condition of the constitution of the patient, as well as the surface* upon which the reproduction of the particular matter is effected, are points of the first importance, and of immediate influence in the solution of the phenomenon. Experience, then, has established the momentous fact, that inoculation does produce a milder variety of small pox; this is likewise the present amount of our knowledge respecting vaccination, viz.: that it is milder than small pox, and a preservative, generally speaking, from it; and, therefore, should be preferred. It may be possible to afford some satisfactory answer to the questions *why, or how*, these phenomena occur? more especially as there is presumptive evidence to shew that these results may be influenced, if not brought about, by constitutional means, or by the difference of the intermedium, through which they are introduced to the animal frame. What have been the results of experience and experiments? These unequivocally concur in shewing that the poison is *specifically, and identically the same in quality*; as persons who have been infected, through the medium of the atmosphere, from a patient having a mild sort from inoculation, will have a severe and malignant kind: neither are those, who have been inoculated from matter taken from a mild, and inoculated sort, exempt from a severe variety. Again, instances are not wanting, and which are well authenticated, to prove that this disease, whether received by inoculation, or by infection, has invariably proved fatal in many families; which peculiarity, and predisposition have been successfully subdued by vaccination. Hence, the doctrine assumed by the advocates of *mutation of quality* in the poison of small pox, as far as observation reaches, appears to have had no solid foundation. The permanence, and immutability of variolous poison are strongly established by the following fact:—The Bramins of India, we are told, inoculate with matter handed down for two or three generations (*see Essai sur l'Inoculation, par M. Chais;*) and in *The City Remembrancer*, a book of considerable authority, we learn that infection has been known to spread through a village upon opening a grave in which a person dying of small pox had been interred *twenty years before*. Experiments forcibly and satisfactorily prove the permanence of the matter of small pox. Sir Astley Cooper delivers the following interesting fact in his Lectures upon this subject:—"Whether morbid poison be taken from the dead or the living, their influence appears to be the same: a medical man, whom you all respect very much, inoculated his child for small pox with matter taken from a subject in the dissecting-room, whose death had been occasioned by this disease; he observed, this was exceedingly wrong, such matter ought not to be made use of, and adds, I merely mention this fact for the purpose of shewing, that the virus, under these circumstances, will produce the disease, and even in its *mildest form*, for the child of this gentleman did extremely well, and had the disease favourably."

A writer in the *Medical Review*, vol. 1, p. 308, observes, with great dis-



cretion and good sense, “we would not, however, assert, that a choice in the matter is absolutely indifferent, and, therefore, to be neglected; for although multiplied trials have shewn, that a mild disease has been produced by matter, taken from a confluent pock, yet where there is an alternative, we would certainly prefer that taken from a benign kind, and from a healthy constitution, were it only to preclude all possibility of accusation on this account, either from others or from ourselves, should the disease prove unfavourable.”

•The late Dr. Woodville, a practitioner of high character, and of critical accuracy, found that “after boiling away a pint of water from a drachm of variolous matter, for three successive times, the residuum still communicated the disease by inoculation.”

When Small Pox existed as an epidemic, which is its natural form, the disease appears in every variety, and degree; sometimes even in different individuals of the same family. In some seasons this disease proved universally mild, and in others extremely severe; this is a fact within the personal experience of many practitioners, *before vaccination was known*; which tends to prove nothing more than what we see with regard to other infectious diseases: thus under the aid and influence of certain causes, atmospheric or constitutional, the same specific, and absolute virus, will produce very different effects.

Again, are there no vitiated states of the constitution, no hereditary taint, which may aggravate the operation of certain morbid poisons? And do not several of these come under the class of morbid poisons themselves, viz., Gout, Cancer, and Scrophula? That these native taints become frequently roused from their dormant state, and are brought into action by mechanical as well as morbid agencies, experience fully proves—rendering many individuals and families victims of pestilential disorders when once excited “by other specific, or even accidental causes—whether by Small Pox, Measles, Scarlatina, or by a common cold, or mechanical injury.”—See *Sir A. Cooper’s Lectures on Morbid Poisons*.

Dr. Bateman, in an interesting paper in the 2d vol. of the *Medico-Chirurgical Transactions*, gives a case of secondary Small Pox in a female, whose child, nine months old, died in consequence of a confluent kind—the disease of the mother passing through a mild and mitigated form.

From an Essay on the mode by which constitutional disease is produced from the inoculation of morbid poisons, by my fellow student, Mr. Charles Salt, the following passages have been selected; for their accuracy of observation, as well as for the beauty of the analogical illustrations they contain:—

“It seems that the constitutional diseases propagated by some morbid poisons, are the only class of diseases which appear to be meliorated by being introduced into the system.”

“It appears to me that the reproduction of the poison by local arterial



secretion, antecedently to its introduction into the constitution, occasions the melioration or change."

"Let us examine how this doctrine applies to the phenomena of morbid poisons in general, and to those attendant upon Small Pox in particular."

"In Small Pox, in common with other morbid poisons, there is this difference between the matter reproduced by local secretion, before its removal from the body of the patient, and subsequent to such removal;—in the former state, it has the property of infecting the person in whom it is secreted, *by direct absorption*, and in the latter, it possesses no such power of infecting that, or any other individual by direct absorption; its power of that kind having ceased *on its removal from the body* in which it was generated," &c.

He continues by saying, "I know that by our senses we are incapable of taking cognizance of the difference in the relative powers of the poisonous fluid in question, under its different circumstances; but it is enough if it can be demonstrated by inference from facts, and this is the ground of proof I assumed."

"I will endeavour to borrow a general analogical illustration from the vegetable kingdom, which will assist in elucidating some other difficulties."

"A pink, propagated by seed, has all the *essential qualities* of another produced from a slip; but varies from it occasionally in the colour and beauty of the flower. The former has all the perfect character of its species—the latter has the same;—but the individual beauty of a particular flower is, in some instances, enhanced by the peculiar colours of its petals, and it stands distinguished on that account from others of the species as a beautiful variety; but similar flowers are not to be obtained from such plants as are subsequently produced by its seed. To preserve the variety, they must all be obtained by the particular mode of propagating by slips."

That the mild variety in the disease of Small Pox from inoculation, compared to the original disease, is, like the flower, a result only to be obtained by a *peculiar mode of propagation*, appears undeniable: but we still find the important *specific qualities* in each poison secreted in the respective diseases *perfect and unimpaired*. *Each diffused in the atmosphere, will produce a severe disorder in the person who receives the infection through that medium; and each propagated by inoculation, will produce a comparatively mild disease; the essential qualities therefore are unchanged.*

"In maintaining then, the character of its species under all modes of propagation, and being distinguishable in some, as a variety only, the disease produced by the poison is very analogous to what has been instanced in the flower."

Thus, it appears, in morbid poisons, that these phenomena are observed invariably to occur, whether their peculiar virus be introduced by infection or insertion; from which it may be concluded that the virus has

the property of preserving its specific essence, unaltered by the air, or the animal economy; which, under the vital operations of the human frame, is capable of producing its kind, possessing its primary qualities. The fact has long since been noticed and established that certain animal secretions produced under the influence of disease, propagate a specific constitutional affection in others, precisely resembling the original disorder that produced them: and when the morbid virus has been introduced by means of the skin, a mild variety, compared with the original disease is the usual result, it will be invariably found that the identity of each poison secreted in the respective diseases has been preserved. Here we see that the essential qualities are unchanged. The same phenomena are observable in the specific diseases of animals.—*Vide Mr. Salt's Essay*, p. 29—*White's Treatise on Veterinary Medicine*, 2nd Edition, p. 22—*Coleman's Works*.

The reader, by consulting the 12th volume of the Medico-Chirurgical Transactions, p. 324, will find a very interesting and valuable paper upon the occurrence of small pox after vaccination, and which deserves to be perused attentively by every parent, and member of society. I have selected a few passages in illustration, as well as for the satisfaction of the public upon a subject of deep interest:—

“In cases where the vaccine virus fails to impart a *perfect* security from the future influence of the variolous poison, it serves, at least, to modify *certain* of its effects,” &c.

1st. “Vaccination does not appear to lessen the violence, or shorten the duration, of the first, or eruptive stage of fever, which is generally as severe, and even sometimes severer, and longer in its duration than that of the casual confluent small pox.”

2d. “It does not appear in like manner to influence the *quantity* of eruption upon the skin, so much at least, as has been generally imagined. It is true that, in many cases of small pox, subsequent to vaccination, the eruption has been very scanty; but, in a large number also, I have seen it very copious, more particularly about the face, breast, and upper extremities, and occasionally fully equal, in point of *quantity*, to what is seen in the worst kinds of confluent or coherent natural small pox.

“The great power of vaccination unquestionably consists in modifying the *progress of inflammation* in the variolous eruption; and here it cannot fail to attract observation, how strikingly opposed to each other, in this respect, are the influences of inoculation and of vaccination. *Inoculation lessens the quantity of eruption, but does not alter, in the slightest degree, the progress of inflammation* in that which is brought out. *Vaccination*, on the other hand, while it does not sensibly affect the *quantity of eruption*, always influences, more or less, the *progress of inflammation*, however copious the eruption may be. The same desirable result, the diminution of mortality is obtained in either way. By checking the quantity of eruption, or the degree to which inflammation in it extends, the disease is prevented from bringing on those impediments to the functions of respiration, and perspiration, which occasion secondary fever, and endanger life.”



The preceding facts distinctly prove that the influence excited by inoculation and vaccination, is upon the animal economy as regards its functions, and not in reference to the quality of the virus. The *effects* of the Small Pox poison are *modified* by vaccination, *not the poison itself*. "The degree to which such modification takes place, varies greatly—to an extent, indeed, hardly conceivable by those who have not paid minute attention to the subject."

This intelligent writer adds, "in the present state of the country, it appears highly desirable that some investigation should take place into the real causes of the occurrence of Small Pox after vaccination, in order to determine, if possible, how far there is any probability of our being able to obviate them in future. The following observations are thrown out with the view of assisting in the determination of this question :—

"1. Small Pox, after vaccination, unquestionably prevails in particular families ; showing, that in them there exists some peculiar susceptibility of the variolous poison"—here follow the instances.

"2. It is certainly worthy of observation, that the great majority of cases of Small Pox subsequent to vaccination which have occurred at the Small Pox Hospital, have been persons between the ages of 15 and 20," &c. "I am induced to entertain the notion, that there is something in the habit of body peculiar to that age, which renders the system more than usually disposed to suffer from the influence of the variolous poison," &c.

"3. In any investigation of the causes of Small Pox subsequent to vaccination, it would be improper to overlook the remarkable connection that subsists between the degree of perfection in the vaccine cicatrix, and the violence of the secondary disease. This important fact was forced upon my attention by the results of the last year's experience at the Small Pox Hospital. It is, indeed, in opposition to the opinion entertained by several authors of acknowledged reputation ; but the extent of my opportunities enables me to speak with much confidence on this point. When the *scar on the arm is perfect, that is, distinct, circular, radiated, and cellulated ; but, above all, when it is small, so that it may be covered by a pea, the secondary affection* (if from peculiarity of habit, or any other less ascertained cause, it does occur) *will be slight, and hardly deserve the name of a disease.*"

"On the other hand, whenever the scar is large, and bears the marks of having been formed by high local inflammation, and wants the other distinctive characters just enumerated, the chance of Small Pox occurring in after-life will be greater, and, *cæteris paribus*, there will be a stronger likelihood of its proving severe."

"These considerations tend to establish, as a *pathological principle*, that the occurrence of Small Pox, subsequent to vaccination, is dependent upon the *intensity of the vaccine influence, as primarily excited* ; and they lead to the belief, that the appearance of the cicatrix (or scar) may be taken as a *measure of that intensity.*"



Hence it appears that the difference generally observable between the disease as excited in one and the other mode, depends upon the state of the constitution, and peculiar predisposing causes; and lastly upon the surface or medium through which the animal economy becomes tainted. This last opinion is corroborated by the comparative ill-success of inoculation, and fatal consequences that generally result from it in China; where it is performed by thrusting up the nostrils dossils of lint or cotton impregnated with Small Pox matter. Dr. Mead has related a case of a young female convict upon whom this mode of inoculation was practised, and who had the disease with great severity. As the membrane that lines the nostrils, is a continuation of that which lines the whole of the internal canal, this mode of infecting the body is closely analogous to that by which natural Small Pox is engendered;—the virus being received in both instances upon an internal membrane—one more acutely susceptible than the skin, and more prone to inflammation; and if the degree of the disease materially depends upon the degree of the primary excitement and disturbance in the system; the nature of the surface upon which the first morbid impression is made, must necessarily be proportionably influential in the quantity of diseased action induced.

Mr. Hunter, when speaking of specific inflammation, observes, “however, even the plague has its degrees of power over a constitution, some being more easily and of course more violently affected by it.” He was the first Physiologist who discovered that morbid poisons were not taken up by *direct absorption*, upon whatever surface the virus was primarily received; “in the inoculation of the small pox all that it does is to stimulate the surrounding parts to secrete a fluid similar to itself, which being absorbed, infects the constitution; and that the patient really receives the disease from variolous matter generated in his own body.”—*See Cruikshank*, p. 120.

The same author states, “there are some parts much more susceptible of specific disease than others. Poisons take their different seats in the body, as if they were allotted to them, these *differences may arise from the nature of the parts themselves*, or from some regular circumstances which must act as exciting causes,” &c.—*See No. 9.*

No. 13. As the unassisted reason of mankind has hitherto failed in discovering the rise of those morbid poisons, whose influence upon the human frame, excites specific and infectious maladies; it may not seem presumptuous, or hopeless, to attempt an elucidation of the origin and appropriation of these mysterious, and noisome agencies, by consulting those infallible records, which contain all that concerns the physical, and moral, condition of man. In elucidating certain points, and principles, which may ultimately be applied to practical purposes, such an enquiry becomes especially necessary, when the object of our research is duly considered—all mankind having an interest in these being so familiarly understood, that no mistake may arise in their application.

In making this appeal to the records of creation, we shall be instructed in the time, occasion, and introduction of many of the morbid poisons, and in the phenomena, which they exhibited; the information, afforded from such a source, must necessarily tend to illustrate their antiquity, as well as, their several natures—whether they be limited, or permanent—incidental, or hereditary—whether, among this numerous class, any traces be discoverable of those, which are, in the present age, universally admitted as, exclusively, confined to our own species.

In these pages will be found written, in language too definite, and clear, to admit of misunderstanding, or misinterpretation, that the majority were by express appointment—that, amongst the most noisome, significant, and deadly, although we have received a most circumstantial narrative of their effects, we are left to infer their precise means of generation:—yet we are distinctly told, that many of them are incurable—being placed beyond all human control. Thus led to a conception of a power, superior to our own, adequate to the causation, and maintenance, of these agencies, we are necessarily brought to the conclusion, from the perception of these and other phenomena without, and within us, of the existence of something prior, which stands to it in the relation of a *cause*, without which it would not be—these relations become, not merely of immediate interest, and value, but as abounding in others, still more extensive; impressing irresistably upon us the instructive belief “that all the longest life, and most vigorous intellect can give us power to discover, by our own research, or time to shew by availing ourselves of that of others, serve only to place us on the frontier of knowledge, and afford a distant glimpse of boundless realms beyond, where no human thought has penetrated.”—*Herschel*.

“Living, then, in a state where such laws, and relations obtain, and being subject to their immediate influence and dominion, it is manifestly of the utmost importance to become acquainted with them, were it for no other reason than to have the law on our side in all we undertake, so as not to struggle in vain, as the preceding distinguished writer has said, against some insuperable difficulty opposed to us by natural causes; what tortures inflicted on patients by imaginary cures of incurable diseases, might have been dispensed with, had a few simple principles of physiology been earlier recognised, and a few authorised facts ascertained, respecting ultimate causes in the infancy of medicine?”

I am not ignorant of there being those, who consider such an appeal as unphilosophical, and as derogatory to the lofty pretensions of human reason, whenever the object of research belongs to the province of physical science. But, it may be asked, can natural science teach us the origin of things—the laws of creation? A knowledge of natural laws may enable us to gain an insight into the sensible qualities, and results, of those processes, and operations, carried on among external objects, or their constituent principles, of which they are merely signals, yet be quite inadequate in enabling us to attain a knowledge of the ultimate, and inward, proces-



ses of nature, in the production of these phenomena; or to penetrate into their direct causation, design, and application. These are the hidden things in the constitution of nature, the solution of which can only be looked for in the records of the Author of Nature. Every attempt hitherto made, "suffices to shew how little prospect there is that, in our investigations of nature, we shall ever be able to arrive at a knowledge of ultimate causes, and will teach us to limit our views to that of laws."

An examination of these ancient records should convince every unprejudiced mind, that certain specific diseases, possessing the properties of transmitting their kind, were by express appointment, and were imposed upon mankind for purposes subservient to their present condition, as presumed in the text,—that these noisome and pestilential agencies were not only employed as signs, and wonders, but as scourges, and warnings, not exclusively for the people and nation, upon whom they were first directed, but for after generations.

I have considered it unnecessary to swell the bulk of the appendix by introducing examples of the preceding facts, first, because they will be familiar to most of my readers, and secondly, because many of the most striking will be found in the notes upon the following paragraph, to illustrate which, their introduction was deemed essential.

Mr. Bryant has observed, that "in considering the history of these visitations, we are obliged to admit and determine, as the Egyptian Priests did, and say, in every instance, this is the finger of God—that they served as scourges, and warnings to those people, and were salutary to others, who were to learn by their example—that all these, as well as other judgments communicated were real prodigies; and, as has been repeatedly urged, were all pointed and significant." Upon the miraculous infection and cure performed upon the hand of Moses, (the first instance of the introduction of specific disease among the records of creation,) the preceding author observes, "from this I should judge that these representations had a covert meaning, and that they did not relate to the Israelites only, but to the whole world, and to the means by which it is to be healed: in short, there are three things presented to our view—the deity, the disease, and the cure,—however concise the history, the meaning cannot be mistaken."

Objections may here be started upon the score of these acts being extraordinary, and miraculous—exclusively relating to a particular people, and introduced for a particular purpose; but the constitution of nature, and the voice of the Author of nature, conspire to teach this momentous and fundamental truth—that a miracle merely supposes a fixed law of nature previously enacted by divine authority, because, it is simply the temporary suspension or interruption of the customary operations of this law which constitutes a miracle. The laws, by which every created thing has been governed from its first formation, have continued unchanged through after ages to the present day, "being made fast for ever, having received a law which cannot be broken."



The judicial punishments brought upon the Egyptians, so significant in their operation, and so particularly adapted to the people upon whom they were inflicted, have been considered, by many of our best biblical commentators, as not exclusively limited to those people, but to be more extensive in their scope, and application; in confirmation of this opinion, the following passage has been deemed important, if not conclusive, more especially from its direct allusion to the occurrences in Egypt, previous to, and after, the Exodus:—"All these things happened unto them for examples; and they are written for our admonition, upon whom the ends of the world are come."—*1st Cor.* ch. x., v. 11. This declaration, it will be found to be immediately succeeded by the exhortation selected as the motto to these pages.

Under the conviction that there is such a thing as a *course of nature*, and that the constitution of nature has received certain laws, by which it is controlled, and by which its permanency is secured—and although such admitted facts do not *prove* our present question, they strengthen those *proofs* derived from other, and independent sources, which unitedly receive their final confirmation from the clear and irresistible fiat of the Author of nature, assuring us, that every created thing—the "whole host of them"—all the works of creation obey certain laws, which are immutable, and "cannot be broken"—that these laws are put into the nature of every thing, whereby, to use the language of Beveridge, "it always keeps itself within such bounds, and acts according to such rules, as have been given it—being exactly fitted to the ends and uses for which it was designed—that the least, and worst, of creatures, and things, in its origin and application, is not in any way derogatory to the Author of nature." Thus the *noisome pestilence*, as well as the venomous serpent, and deadly asp—all of which are still in existence—have at various times, and on especial occasions, visited man, either by direct and apparent appointment, or by the occult, yet equally certain, operation of the *course of nature*; "for it is easy, for instance, to see physical and moral events playing into one another's hands, as it were, in a marvellous manner, in the administration of *this world*; rain or drought working out famine, and famine working out national demoralization; and thus the virtue or vice of mankind greatly determined by vapours, precipitated or held in solution."

It has been observed by the same writer, that "the *moral world*, as well as the physical, may proceed according to general laws till an accumulation of inconvenience demands the interference of a miracle; this, too, according to a general law, a law by which it was appointed, when the foundation of the world was laid, that, under such and such circumstances, miracles should be," &c.; and if it be objected that this is to deprive miracles of their value as tokens of divine commission—as credentials of his ambassadors—we answer no such consequences could ensue. After all, what is a miracle, but an apparent deviation from the established course of nature, with a view to a moral effect? "But nothing is more

usual than to see events in the natural world made subservient to moral ends; indeed, so usual, that it may be doubted whether every individual event is not intended to produce finally some moral purpose—there may be difficulties in either case, &c., but our argument is this,—that whilst we see in God's natural government apparent interruptions of general laws, or phenomena, which if assignable to such as we can discover, are, therefore, classed under the head *accidents* (which, like *sundries*, mean just what we can give no account of); we have no need to be staggered at the same, or similar mechanism in the moral government," &c.—*See Quart. Review*, No. 85, Art. 6, on the *Writings of Bishop Butler*.

*Vide Locke*, p. 322, chap. xxvi. *Of cause and effect, and other relations*. "In the notice that our senses take of the constant vicissitude of things, we cannot but observe, that several particulars, both qualities and substances, begin to exist, and that they receive this their existence from the due application and operation of some other being. From this observation we get our ideas of cause and effect, &c. Again, having thus, from what our senses are able to discern, in the operations of bodies on one another, got the notion of cause and effect, viz., that a cause is that, which makes any other thing, and an effect is that, which has its beginning from some other thing; the mind finds no difficulty to distinguish the several originals of things into two sorts.

"First, when the thing is wholly made new, so that no part thereof can exist before, as when a new particle of matter doth begin to exist, in the nature of things, which had before no being, and this we call creation."

"Secondly, when a thing is made up of particles which did all of them before exist, but that very thing so constituted of the existing particles, which, considered altogether, make up such a collection of simple ideas, as had not any existence before; and then, when referred to a substance, produced in the ordinary course of things, by internal principle, but set on work and received from some external agent and cause, and working by insensible means, which we perceive not, we call generation."

PALEY'S NATURAL THEOLOGY, p. 187.—"Relation of parts to one another accompanies us throughout the whole animal economy. But relation perhaps is never so striking as when it subsists, not between different parts of the same thing, but between different things. The relation between a lock and key, is more obvious, than it is between different parts of the lock, &c. But since the contrivances of nature decidedly evince intention; and since the course of this world, and the contrivances of nature have the same author; we are, by the force of this connexion, led to believe, that the appearances, under which events take place, are reconcileable with the supposition of design on the part of the deity. It is enough that they be reconcileable with the supposition; and it is undoubtedly true



that they are reconcilable, though we cannot reconcile them. The mind however which contemplates the works of nature, and in these works, sees so much of means directed to ends, of beneficial effects brought about by wise expedients, of connected trains of causes terminating in the happiest results, &c., a mind I say drawn into the habit of thought which these observations excite, can hardly turn its views to the condition of our own species, without endeavouring to suggest to itself, some purpose, and some design, for which the state in which we are placed is fitted, and which it is made to serve."

The economy which nature has adopted when the purpose was to transmit to man the influence of morbid poisons, and to derive from the animal function of secretion their several species, thus carrying on and preserving inviolable their identity and individuality, along with them, through all their changes of form, or of visible qualities, is strikingly analogous to those operations which are obvious in the ordinary deviation of plants and animals from one another—"a particle, in many cases, minuter than all assignable, all credible dimensions; an aura, an effluvium, an infinitesimal, determines the generation of a future body; does no less than fix, whether that which is about to be produced shall be a vegetable, a merely sentient, or rational being, makes all these differences; gives to the future body its *qualities*, and *nature*, and *species*: and this particle, from which springs, and by which is determined a whole future nature, itself proceeds from, and owes its constitution to, a prior body: nevertheless, which is seen in plants most decisively, the incepted organization, though formed within and through, and by a preceding organization, is not corrupted by its corruptions, or destroyed by its dissolution; but, on the contrary, is sometimes extricated, and developed by these very causes, survives, and comes into action, when the purpose for which it was prepared requires its use."—*Paley's Natural Theology*.

There would be no difficulty in pursuing this parallel, in spirit and in letter, to almost any extent that analogy would warrant—as it is most true that each virus, as each seed, has its own body—these both fall to dissolution when committed to their relative soils—their several forms are not quickened—they decay and become effete: yet the constituent principle of the one, and the vital principle of the other, survive the destruction of their several bodies,—both being propagated and sustained through the instrumentality of a vital process,—are thus preserved and continued by an emanation of the same Power, that controls all created things; and although, in the language of a strong writer, in advocating the system of arguing from analogy, "we doubt not that persons who have been unused to this peculiar method of argument, will look upon much that we have said, or may have to say as fanciful, yet we have no fear of the result, if they will make the subject of analogy a vade-mecum in their ordinary walks through life, and note the wide compass within which it is capable of application." In comparing the phenomena of morbid poisons



with those poisons that belong to animals and vegetables in regard to their generation, there will be found a most singular correspondence, furnishing strong reason for believing, that the author of one is the author of all.

We observe in the structure, and functions, of the human frame, a suitability to receive impressions from the virus of morbid poisons, and to propagate, by the process of secretion, the virus of the same species—characteristic of each kind. It is this intimate and specific relation, which the human body holds, in its constitution and property, to natures altogether external to their own—to *inanimate substances*, and to the *specific qualities* of them—this construction of an instrument, this choice and adaptation of means, that creative intelligence is seen. These imply design, effect, and use; and silence every suggestion that chance, or equivocal generation, can be concerned in the creation and generation of morbid poisons.

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In addition to those impediments, which, the advocates of equivocal generation have, from time to time, thrown in the way of inquiries, instituted for the purpose of ascertaining the causes, and nature, of the different morbid poisons; as well as, to the objections, which have been raised by others, who are the direct opponents of their creation, as well as, of their provisions, and appropriation, being by direct appointment; there are some who have questioned, whether there be any specific, and infectious diseases, peculiar to man—assigning such reasons as the following—“while the causes of diseases in general are so obscure, and the exact series of phenomena has been ascertained in so few instances, it is hazardous to set down any particular affections as belonging exclusively to man: other animals might be affected, if exposed to the same causes.” Granting the difficulties, and obscurity to be great, as just stated, the experience of all ages inculcates the belief, that there is a class of diseases exclusively human—that is, of which no other animal has disclosed the slightest susceptibility—the only solitary instance that has fallen within my own reading, has been advanced by Blumenback; but as this affection was only local, and the relation of the case is unaccompanied by any proof of its arising from a virulent nature, or of its communicating its virus to any other animal, the exception cannot be considered as affecting the rule here maintained—“A monkey at Amsterdam contracted a local ulcer from the contagion of Small Pox, but had no fever.”—See *Blumenback De G. H. Var. Nat.* p. 59.

Glandular affections, apparently resembling Scrophula, have been noticed to occur in these animals, though their identity with this human and hereditary taint is not shewn.

See Lawrence's *Physiology*, p. 223—in a note upon Scrophula, included in Blumenback's list of human diseases—“Monkeys perish, in these cli-

mates, of affections very much resembling Scrophula." Again, "Monkeys are carried off in North America by consumption, and tubercular affections of the abdominal viscera. They exhibit morbid appearances analogous to those just mentioned, (meaning affections occurring in negroes) to which, others of the bones are often added. The general unhealthy condition of the frame, in both cases, would, I apprehend, be termed by nosologists Scrophula, and its cause is probably the coldness of the climate, together, in the case of animals, with confinement, impure air, and unnatural food."

Under the head of Monkey Worship and Disease, in Bingley's Animal Biography, is the following narrative:—"In Amadabad, the capital of Gazaret, there are three hospitals for animals, where lame and sick monkeys, and even those in health, choose to dwell in."

Affections of the glands, as well as epidemical, and contagious diseases, are observed to occur in most of our domestic animals—these, with the exception of hydro-phobia, and cow pox, are exclusively limited to this class of beings, forming the particular province of the veterinary art.—*See the Works of Coleman, Clarke, and White, &c.*

Mr. Hunter has observed, 4to. p. 225—6, "In all complicated animals, among which man is the most complex, the parts are composed of different structures, and we find, that in such animals, the powers of action of those different structures, within themselves, are very different; when they are, therefore, excited to any common action, the varieties produced should be well known, and particularly attended to. Besides, every similar structure in different animals does not always act in the same manner. Thus we cannot make a horse vomit, nor give any specific diseases, which attack the human subject, to any other animal, more particularly the morbid poisons. The mode, therefore, of action in one animal does not implicitly direct to the mode of action in another," &c., p. 224. "Disease is the only circumstance which exposes these principles to our view."

Although many additional proofs might be selected, in illustration of the opinions set forth in the text, viz., that certain specific diseases were imposed upon mankind, for purposes subservient to their present condition,—and that these have been considered as forming a distinct class in reference solely to man:—sufficient have already been advanced, without occupying, any further, the attention of the reader, to afford him an opportunity of forming his own judgment upon the points brought before him—his attention, therefore, will next be directed to the *relation*, which morbid poisons bear to the human frame, and to their *generation* by a vital function; and how these agencies, and their results, stand connected as cause and effect, by having recourse, for the illustration, and explanation, of these phenomena, to analogy; thus comparing them with those agencies, and their operations, in which we notice invariable connection, and in particular, invariable ante-cedence of cause and effect, and their invariable relation to the producing intermedium; though the process, may not be apparent, by which such a cause can produce the effect.—*See Herschel on this point, p. 152.*



No. 14. That the land of Mizraim has not been capriciously stigmatised, as the plague spot of the East; the lessons of all history, and the voice of tradition, irresistably prove. These all point, with the truth of the magnetic needle, to the seat of Pharoah, as to a centre; whence emanated most of those specific diseases, which, by commerce and war—by oppression and cruelty—have visited, through succeeding ages, every nation and people, in the civilized world.

We read, that the Egyptians were the first people, upon whom the plague of leprosy, as well as the other plagues, were judicially executed—although, its miraculous infliction, and cure, had been previously exhibited, upon the hand of Moses, in conjunction with another equally significant conversion, as emblematical credentials of his qualification and authority—the former seems to have been a prelude to the future visitation of the Egyptians; yet both implying, in a covert manner, that the work should not be ascribed to the means.

Though these punishments, brought upon the Egyptians, bore a strict analogy with their crimes, yet we find that these were extended to other nations, indiscriminately, in process of time; neither is this a subject of surprise, when we learn from the pages of ancient, and modern, history; that their idolatrous rites, and customs, were introduced into all the countries of the East.

The following passages have been selected as the most significant, proving, at the same time, how peculiarly afflicted the Egyptians were with the most noisome and pestilential diseases, at a very early period of their history:—

“And they took ashes of the furnace and stood before Pharoah; and Moses sprinkled them up toward heaven; and it became a boil, breaking forth with blains upon man, and upon beast: And the magicians could not stand before Moses because of the boils; for the boil was upon the magicians, and upon all the Egyptians.”—*Exodus*, c. ix., v. 10, 11.

The Hebrew word properly signifies an *inflammation*, which first makes a tumour, “or boil,” as we translate it, and thence turns into a grievous ulcer. Moses speaks of it afterwards as an unusual plague “the botch of Egypt.”—*Deut.* c. xx. v. 27—*Bp. Patrick, Stackhouse.*

This plague, Dr. Hales, and Mr. Bryant observe, “converted another of the elements, and of their Gods, *the air or ether*, into an instrument of their chastisement.”

It is worthy of observation in this place, that all the judicial plagues, specified in the Mosaical history, were either elements, creatures, or created things (excepting the boils), previously in existence; which, it is reasonable to infer, were introduced upon this especial occasion, for the first time; it follows, that they were pestilential, and contagious, from passages in Deuteronomy; and *Exodus*, c. ix., v. 14, 15, “For I will at this time send all my plagues upon thine heart, &c.; for now I will stretch out my hand, that I may smite thee, and thy people, with pestilence,” &c.



"The leprosy, in all its stages, and under all its appearances, is one of the most calamitous of diseases. We, in Britain, have long been, for the most part, happily freed from it by a variety of causes, and, therefore, we are not able to form just conceptions of its various distinctions, and their appearances, in the hotter parts of the globe."—*Scripture Illustrations*.

"The leprosy, it is supposed, was a disease at first peculiar to the Egyptians, and which from thence spread into Syria. But the leprosy, provided against by the law of Moses, was not so much a common disease, or a legal pollution, as a divine infliction for the punishment of some grievous sin in the leprous person; for it is difficult to conceive how such a pestilential disease, as not only infected men's bodies, but the very walls of their houses, and their garments, should proceed merely from natural causes; and, therefore, it was always understood that the miraculous hand of God was in some measure concerned in it."—*Lewis*.

"And the leper in whom the plague is, his clothes shall be rent, and his head bare, and he shall put a covering upon his upper lip, and shall cry Unclean, Unclean."—*Leviticus*, ch. xiii., v. 45.

This was designed to distinguish him from others who were sound and in good health. His head was to be bare for similar reasons, and a covering was put on his upper lip, to prevent more or less the spreading of infection by his breath. He was to say, "Unclean, Unclean," as much as to say, keep at a distance from me, I am both legally impure and *physically infectious*. This proclamation, some of the Hebrews say, was made by a public officer.—*Biblioth. Bibl.*

"He shall dwell alone; without the camp shall his habitation be." The Persians, as we find from Herodotus, followed this discipline. "It is probable there were certain places, where those, who were diseased with the leprosy, were secluded."—*Lightfoot*.

BURCKHARDT, on the BEDOUINS AND WAHABYS, says—"The miserable wretch who is afflicted with leprosy, is regarded with contempt and disgust; no one will sleep near him, nor eat from the same dish with him, and any intermarriage with his family is strictly forbidden."—*See Lev.* ch. xiii. v. 45.

That varieties of leprosy have been experienced all over the civilized world, is a fact too well known to require very particular notice. The plague of leprosy in the head and beard, mentioned in *Levit.* ch. xiii. v. 29, 30, has been frequently noticed. Maimonides tells us, that in this sort of leprosy, the hair on the head or beard fell off by the roots, and the place of the hair became bald. This seems to have been that kind of disease which, Pliny says, came into Italy in the middle of the reign of Tiberius Cæsar, and was called *Mentagra*, because it commonly began in the chin, and which was so filthy that any death was preferable to it.—*Bp. Patrick*.

Manetho, alluding to "the cleansing Egypt of all lepers, and other unclean persons that were in it," says, "the King gathered together out of the land of Egypt all that laboured under any defect of body, to the

amount of eighty thousands, &c., that they might be separated from the rest of the Egyptians. And (he says) there were among them some learned priests who were affected with leprosy."—*Manetho; Of the Israelites. By J. P. Cory, Esq., &c.*

Again, "The Lord shall make the pestilence cleave unto thee, until he have consumed thee from off the land, whither thou goest to possess—he will smite thee with a consumption, and with a fever, and with an inflammation, and with an extreme burning, &c.—with the botch of Egypt, and with the emerods, and with the scab, and with the itch, whereof thou canst not be healed—with madness, and blindness, and astonishment of heart—he shall smite thee in the knees, and in the legs, with a sore botch\* that cannot be healed, from the sole of thy foot unto the top of thy head—and these curses shall be upon thee for a sign, and for a wonder, and upon thy seed for ever—he will make thy plagues wonderful, and the plagues of thy seed, even great plagues, and of long continuance; and sore sickness, and of long continuance—moreover, he will bring upon you all the diseases of Egypt, which thou wast afraid of; and they shall cleave unto thee—also every sickness, every plague, which is not written in the book of this law, them will the Lord bring upon thee," &c.—*Deut. c. xxviii., v. 21, &c.*

*Jeremiah*, ch. xlv. v. 13. "For I will punish them that dwell in the land of Egypt, &c., by the sword, by the famine, and by the pestilence."—*Ch. xlii. v. 17—22.*

*Isaiah*, ch. iii. v. 17. "I will smite with a scab the crown of the head of the daughters of Zion." V. 24. "And instead of well set hair, baldness."

*Esdras*, ch. xvi., v. 1. "Woe be unto thee, Babylon, and Asia! woe be unto thee, Egypt, and Syria!" V. 5. "Plagues are sent unto you, and what is he that may drive them away?" 14. "Behold the plagues are sent, and shall not return again, until they come upon the earth." 19. "Behold, famine and plague, tribulation and anguish, are sent as scourges for amendment."

Mr. Bryant, supported by the highest authorities, which will be found in his work upon the Egyptian Plagues, p. 160, says, "The Professors of Medicine were in great numbers in Egypt: each distemper having its proper Physician, to which his practice was confined." "Each Physician, Herodotus states, is limited to one disease; and engages with no more. The whole country abounds with the Professors of Medicine."

\* This seems to be a correct description of the *Elephantiasis*: and of this the sacred writer says, it "cannot be healed."

"The Elephantiasis is a kind of vehement leprosy, in which the body becomes covered with a foul, ulcerous, hardened skin, which resembles the skin of an elephant. In process of time tumours are formed in different parts of the body, and these tumours degenerate into incurable sores, which successively corrode deeply the flesh."—*Michaelis*

"As no cure has hitherto been discovered for this disease, it agrees perfectly with the description of Moses."—*Scripture Illustrations.*

"Go up into Gilead, and take balm, O virgin, the daughter of Egypt: in vain shalt thou use many medicines, for thou shalt not be cured."—*Jeremiah, c. xli., v. 11.*



“The people seem to have been liable to many distempers; some of which were epidemical, as we find them to be at this day. The Egyptians were continually providing against disorders; and they had persons, who pretended to foretell their coming both upon man and upon beast. In the time of Moses, we read of a particular distemper, called the botch of Egypt; and the diseases of the country are mentioned in more places than one of Scripture. In consequence of this the people were in a continual state of purgation, and reposed a great confidence in their Physicians; who were maintained at the expense of the public. These joined astrology to physic; upon which they founded their pretended foresight in respect to impending maladies; and in consequence of it they were continually prescribing antidotes and preventives to the people.” “They had many books of great antiquity upon the subject of medicine; what are stiled books, and treatises, are supposed to have been originally hieroglyphical writings upon obelisks; or else in the sacred recesses, which were formed in the rocks of Upper Egypt. They are by Manetho attributed to Hermes; of whom we have an account, given by Clemens of Alexandria, that he composed forty-two books concerning all sciences; of which six related to medicine—with these the Pastophori (the carriers of the treatises of physic) are particularly concerned: for they relate to Pharmacy, and are treatises concerning the management of the body; also about different distempers, about medical instruments, and medicines, and complaints of the eyes, &c. That this learning was originally consigned to the cryptæ or sacred caverns of Egypt, and to the obelisks, is mentioned by Manetho of Sebennys, which shews its great antiquity. In consequence of this, the Egyptians were always famed for their knowledge in medicine, and their Physicians were held in great repute.”

“Athothis, his son,” (namely, of Menes or Mizraim, one of the sons of Ham) “reigned 57 years; he built the palaces of Memphis, and left the anatomical books, for he was a Physician. Venephes reigned 23 years; in his time a great plague raged through Egypt, &c. Semenphis reigned 18 years; in his reign a terrible pestilence afflicted Egypt.”—*Manetho's Egyptian Dynasties after the Deluge. By J. P. Cory, Esq., Fellow of Caius College, Cambridge.*

In allusion to the Symbolical Serpent, it is well known that emblems of this sort were in process of time abused, and gave rise to a base worship, which prevailed over all the world.

SANCHONIATHO'S COSMOGONY.—“From Misor (Mizraim) came Taautus; him the Egyptians called Thor, and the Greeks Hermes, &c. From these descended others, who discovered medicinal herbs, and the cure of poisons and charins, &c.” “But before these things the god Taautus, having represented Oûrânus, made types of the countenances of the gods Cronus, and Dagon, and the sacred characters of the other elements,” &c.—Pages 8, 14.

OF THE SERPENT.—Taautus first consecrated the basilisk, and intro-



duced the worship of the serpent tribe; in which he was followed by the Phœnicians and Egyptians. For this animal was held by him to be the most inspirited of all the reptiles, and of a fiery nature; and it is very long-lived, and has the quality not only of putting off its old age, and assuming a second youth, but it receives a greater increase. And when it has fulfilled the appointed measure of its existence, it consumes itself; as Taautus has laid down in the sacred books, wherefore this animal is introduced in the sacred rites and mysteries.”—Page 17.

SEE BRYANT ON THE PLAGUES OF EGYPT.—The Egyptians made the serpent an emblem of divine wisdom and power, and it was supposed to have been first adopted, for this sacred purpose by Thoth of Egypt, &c., called likewise Taut or Taautus—and in many places in Egypt they were preserved alive, and received divine honours—hence Justin Martyn says, “Among all the things, which are held by you as sacred and divine, the serpent is particularly marked as a wonderful emblem and great mystery. Two were kept alive in Upper Egypt—many salutary qualities and effects were supposed to have been denoted by this emblem, &c. It made a principal part in most rites and mysteries: and there were undoubtedly some very curious truths veiled under this characteristic. The animal was a sacred appendage to the representation of many deities, but especially of Thoth or Hermes, the divine physician (an Egyptian deity, the same as Mercury). The deities Cneph, Hermes, and Agatho-dæmon, were all described under this emblem. He was called Thermutis.”—*See Æliam de animalibus. Lib. iv.*

Esculapius called the inventor, hence the god of Medicine, and the god of health, was brought from Egypt in the form of a large serpent, and in after times was worshipped in Greece and Rome and other parts of the world. His image was usually represented holding in one hand a knotted stick, with a serpent twisted round it.—*See Lempriere.—Livy Epit. Lib. xi.—Ovid’s Metamorph. Lib. xv.—Spence’s Polymetis. Dialog. ix. page, 132, &c.*

Mercury, the celebrated god of antiquity, called Hermes by the Greeks, was called Thaut by the Egyptians: one of the chief ensigns of his power and offices is his *caduceus*, &c., viz., a rod or staff with figures of two snakes twisted about it.

No. 15. It would be contrary to experience, and reason, to deny, that the human frame is not sensibly, and materially, influenced by certain conditions, and viscissitudes, of the atmosphere; yet, my own observation, and reflection, do not warrant me to go to those lengths, to which many have gone, in admitting the belief, that so great a change may be effected by “certain secret constitutions of the air,” to use the language of Sydenham, as to create the virus of any specific and infectious disease; or to produce any neutralization, or mutation, of the qualities of any morbid poison, that owes its generation to the functions of animal life.

I am aware that, in hazarding an opinion upon this subject, I am treading upon delicate and dangerous ground; but finding that the doctrine of *atmospheric constitution*, (which was formerly so universally advocated, especially by the renowned writer, to whom allusion has just been made,) has recently been resumed, and ably handled, by a Physician of rising celebrity in this country,\* though under a more significant term, *epidemic constitution*; I have ventured to express the results of my own enquiries into the subject, more particularly as there is a general resemblance in our views respecting the influence of certain conditions of the atmosphere upon the animal economy.

“That the presence of infectious matter is not alone sufficient to make the Plague epidemical, but that some concurrent states of the air, and of the human body, is likewise necessary, &c.; but a proper state of the air is not the only circumstance necessary to promote the operation of contagion. During the epidemical constitution, it is highly probable that good diet, and good spirits, and cleanliness, and fresh air, and proper clothing, and exercise, may all contribute to render the body less susceptible of disease; the seeds of which, like those of vegetables, will then only spring up, and thrive, when they fall upon a soil convenient for their growth.”—See Dr. W. Herberden, on the *Increase and Decrease of Diseases*, p. 95, 68.

As it is not the intention of the writer to enter into any discussion upon those occult, and probably inexplicable, conditions, of the atmosphere—its temperature, and specific gravity—which are found at one time to aid, and at another time to retard, and suspend, the transmission of virulent effluvia—thus, becoming their conductors, or con-ductors, as circumstances may determine—it will be sufficient for him to state, with as much perspicuity as he is able, his own views of those interesting phenomena, which are more obvious, and which have been attained by experiment, and observation.

The relation which man holds to the element that surrounds him; and that, which it has been presumed, subsists between the human frame, and the virus of morbid poison, naturally suggest the idea; that a mutual relation might exist between the latter agent, and the air, as is known to obtain between the former, and the same element; especially as subserviency, to a common purpose, is observable in both instances. It has been before stated, that the bodies of animals hold, in their constitution, and properties, a close, and important, relation to natures, altogether external to their own—to inanimate substances, and to the specific qualities of these—that is, they hold a strict relation to the *elements*, by which they are surrounded. Does not analogy demonstrate, that inanimate bodies, and their specific qualities, hold as strict a relation to the *elements*, that surround *them*, as has been just instanced to exist between animate bodies and their elements?

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\* See Dr. Macmichael's *New Views of the Infection of Scarlet Fever*.



For example,—are the specific, and physical, characters of minerals,—their primary qualities, and gravities,—subject to mutation, or decomposition, from their juxta-position, and from the relation they hold, to those elementary substances, with which they are combined in nature? Chemical analysis, and observation, reply in the negative—as similar results have been afforded, by subjecting calcareous spar to a strict analytical process—thus, the ultimate chrystallized molecule—the invariable nucleus—which is the basis, or rudiment, of this chrystallized body,—is found invariably the same—unchanged by the calcareous matrix, its native element—all its particles being of a particular, a rhomboidal figure—hence, a primitive nucleus has been ascertained in all chrystallized bodies, which preserves its form universally, while it remains in its natural relation with its elementary stratum.

The theory of chrystallization, in an especial manner, not merely illustrates the point under our immediate consideration, but the theory likewise of *primary quality*, which has been adduced in these pages, to elucidate the immutable nature of morbid poisons. This theory, then, is founded upon a peculiar disposition of the constituent parts of chrystallized bodies—hence it has been concluded; that the internal structure of all crystals of the same body is alike, however the external shape differs.—See *Brande's Chem. Essays*, vol. i., p. 197, 212. These facts answer to both theories—the points of one illustrate the other.

In returning, then, to the question of the relations which subsist between the thing produced, the generating cause, and their common inter-medium—their recipient—it is necessary to take into contemplation the relation, which other products of generation hold to the elements, by which they are surrounded. It appears to my mind, that if we entertained an opinion, that the virus of morbid poison, did not hold this aptitude to the common atmosphere, which other seeds are presumed to hear; we should be suggesting, and entertaining, an anomaly in nature. Analogy instructs us in the idea, that *this law of relation* between the ova, and seeds, of animals, and vegetables, and their common element—(for it matters not, whether it be water, or air)—is invariably, and essentially, the same; proving that such element is equally necessary for their reception, maintenance, and preservation, as for the animals and vegetables themselves. If this were otherwise, the connection between the effect, the medium, and the cause, would be in danger of being annihilated, in every instance, in which specific generation was concerned—as no distinct species of animals, or vegetables, could be perpetuated, according to our present knowledge of their laws, and their relations, if this *special* boundary—this natural, and *vital*, demarcation—became subject to neutralization, mutation, or decay, from the chemical, and destructive, influences of their natural elements—their ova, and seeds, in this manner becoming disqualified for effecting their destined ends. Thus utter destruction of specific difference, in all organized beings, would be the inevitable result



of such a doctrine—for who could say at what point incepted, and progressive, mutation would stop?

Might not such destructive results be expected to occur, if the *virus*, of those morbid poisons, which excite *infectious diseases*, was liable to *change*, from the influence of the atmosphere; the natural medium of transmission, for the ultimate accomplishment of their propagation. The consequence must have, inevitably, been, that those specific morbid poisons, which, there is good reason for believing, existed, anterior to common tradition, or to human record, would have been destroyed centuries ago; by being deprived of that primary, constituent, and exciting principle, which capacitated them for beginning their destined course;—for running again and again their natural round;—which, whenever circumstances favoured their operation, enabled them to renew that morbid series of sequences, which, in one continued chain, has, without mutation of quality, or diminution of intensity, extended to the present hour.

We may possibly arrive at a more accurate knowledge of the point before us, viz., whether the primary qualities of morbid poisons are subject to destruction from the influence of the atmosphere,—by looking, more closely, into the component parts of this element, and into the changes to which it is liable.

The universal adjustment, of the general properties of the air, is felt, and acknowledged, by all mankind; yet the causes of this fitness may not be as clearly understood. It is equally essential to animals, and vegetables; as neither can exist in a vacuum. It is, however, in its ordinary state, subject to be contaminated with foreign substances; which have been found to affect, and injure, the health of animals, as well as man.

Many of these causes have been ascertained by the aid of physical science; and, so far as the discovery has proceeded, “they open to us, (as Paley observes) a beautiful, and wonderful, economy—they shew, that there is a constant circulation of benefits maintained, between the two great provinces of organized nature. The plant purifies what the animal has poisoned; in return, the contaminated air is more than ordinarily nutritious to the plant”—it is the strict relation, which the air bears to the constitution of organized bodies, and, probably, to the constituent principles of certain inanimate substances, that renders a particular enquiry, and acquaintance, with this element so desirable—especially, if it should afford a solution of some of those difficulties, which arise, while investigating the morbid phenomena, under consideration.

It may suffice, for our present purpose, to state broadly, that the economy of animals, and vegetables, has a mutual relation to the air—thus, the structure, and functions of the former, bear a close aptitude to the component parts of the latter; and vice versâ. This being agreed, we will next proceed to enquire into the mutual actions of these agents upon the atmosphere, and into the changes, to which it is subjected, by their reciprocal operation.

The essential component parts of the air are *oxygen*, and *nitrogen*,—the former supports, while the latter destroys, animal life—hence, it is called *azot*. Again, while vegetables, and plants, readily absorb carbonic acid, and probably the nitrogen, for their nourishment, they freely give out oxygen.

The change, effected upon the atmosphere by respiration, consists, in a portion of the oxygen being converted into carbonic acid, viz., by a union of the carbon, thrown off by the lungs,\* with the oxygen of the atmosphere, being more or less loaded with aqueous vapour. The blood, thus oxygenated, or rather robbed of its carbon, becomes fitted for all the purposes of life, and consequently, for the *preservation of health*. A similar office to this is performed by the skin,—carbonic acid, and nitrogen, being the principal products of perspiration;—other component parts of the animal system are likewise given off, by this process; the traces of which are generally slight.

It has been ascertained, by experiment, that the *composition of atmospheric air* is extremely uniform, in all parts of the world—and at all heights above its surface; and that its proportions, according to Mr. Brande, are by measure 21 of oxygen, 79 of nitrogen; besides these essential component parts, it contains other substances, which, however, may be regarded *adventitious*; the quantity of which is liable to vary—of these, *carbonic acid, nitrogen, and aqueous vapour* are the most important and constant.—See Brande, on *Atmospheric Air*, vol. i., p. 369.

It is a fact, of the greatest practical importance, to have had discovered and explained, viz., that a given portion of air can only be respired for a given time, as it soon produces difficulty of breathing, giddiness, and faintness—these being the effects of crowded and heated apartments;—the explanation shews, that this *inconvenience* has arisen, from the presence of *carbonic acid gas*; and experiments have been instituted, which proved, by the *absorption of this substance*, that the *air had been purified*, and fit for respiration. It may here be remarked, that the *nitrogen, always present in the air*, is invariably returned, in expiration, *undiminished in quantity, and unchanged in quality*—hence these experiments have shewn that *carbonic acid* is *unrespirable*—though it appears that nitrogen is a powerful *sedative, hurtful to the constitution, by destroying its irritability*, which is a *distinct attribute of life*. All animals, as well as man, agree in the production of carbonic acid—consequently the deterioration, suffered by the air, is similar throughout the animal creation.—See Brande, vol. iii., p. 225, on *Air*.

The lungs do not exclusively furnish carbonic acid—the skin is constantly giving off this deleterious material,† as well as nitrogen, and other

\* Ten ounces of carbon are given off from the lungs in the form of gas in twenty-four hours.—Messrs Allen and Pepys.

† Alluding to experiments made upon insensible perspiration (the thermometer ranging



component parts of animal excretions; these substances, in the form of aqueous, as well as, of aëriform vapour, are continually evolved from the skin—yet nitrogen, though an aëriform substance, has no affinity to water, being insoluble in it. The fact, that these substances form a principal component part of animal perspiration, has been long established.—See *Abernethy's Essay on the Nature of the Matter of Perspiration, &c.*—Dr. Priestly, and Dr. Ingenhouze, on the same subject.

Mr. Cruikshank had, previously to these discoveries, entertained the opinion, that the matter of perspiration, and that expelled from the lungs, in breathing, resembled each other in their qualities.

It is evident, from the statements just made, that, if there were not antagonists in nature, every where present, to counteract the deteriorating influences of these excretory processes of animals, their preponderating force would, ultimately, destroy that equilibrium in the atmospheric air; which is essential to animal life. But we learn that a provision has been made, adequate to the restoration, and maintenance, of this vital element; and that the vegetable kingdom purifies, what had been contaminated by animals.

Enquiries into the structure, and growth, of plants, and into the chemical processes of vegetation, furnish us with a ready solution of the phenomena; and inform us, how these salutary changes are effected. These are produced principally by means of their leaves; for, while they inhale moisture, they *absorb carbonic acid*, and *evolve oxygen*: this evolution takes place, in greatest force, while plants are exposed to the rays of the sun; and appears to be one of the most efficient, and natural, causes, hitherto suggested, of the purification of the air.—See *Brande upon this subject*—*Davy's Agricultural Chemistry*—*Saussure's Research. Chimiques sur la Végétation.*

As the leaves of plants collect nourishment from the atmosphere, the nitrogen, as well as the carbon, is supposed to be, in certain proportions, removed by them,—it being rejected by the lungs, and evolved in the form of animal perspiration.

Hitherto, we have been contemplating the *natural* agencies, that are perpetually, and *involuntarily*, employed in the consumption, and restoration, of that element, which is equally essential to the preservation of the two great provinces in nature.

A more striking instance of the close, and important, relation, which organized bodies hold, in their constitution, and properties, to the elements, by which they are surrounded, cannot, in all probability, be found among the works of nature. “This was evidently constituted upon the

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between 60 and 70), “two drams of carbonic gas by measure, was emitted from the hand in one hour”—and adds, “if then the insensible perspiration of all parts were equal, 77 dram measures of carbonic gas, and one-third of that of nitrogenous gas, would be emitted from the surface of the body in the space of an hour.”—See *Abernethy's Physiological Essays*, Part ii., p. 138.



supposition of such a fluid—of a fluid, with such particular properties, being always present—change the properties of the fluid, as we have learnt, and the functions cannot act; change the functions, and the properties of the fluid would be lost. The structure, therefore, of our organs, and the properties of our atmosphere, are made for one another. Neither does it alter the relation, whether you allege the organs to be made for the element, or the element as prepared for the organs—the end is the same.”—*Paley's Natural Theology*.

This harmony, however, we learn, is constantly subject to interruption; and frequently to such an extent, as to affect the human constitution, in various ways.

Besides the component parts of the atmosphere, adventitious substances have been detected, in various quantities—of which carbonic acid, and aqueous vapour, are the most constant, and most important;—to the former, in all probability, are principally owing those deleterious influences upon the human constitution, which are marked by depression, and debility—inducing a state below par; frequently accompanied with nervous irritability, and with great constitutional derangement.

The other most prolific sources of noxious exhalations, which contaminate the atmosphere, are the putrefaction, and fermentation of animal, and vegetable substances, of stagnant water, and of various soils, &c., the products arising from these, do not vary so much, as might be expected; this resemblance may depend upon the very few constituent elements, which belong to the two organized kingdoms, and which are found to vary only, in one article, viz., nitrogen.

The gas evolved, during the decomposition of animal matter, consists of its several component materials, carbon, &c., and of the new combinations, which are formed, during the process of putrefaction. Thus, carburetted, sulphuretted hydrogen, &c., and traces of carbonic acid, and nitrogen are found—that, afforded by the fermentation of vegetables, consists of their elementary principles, carbon, and nitrogen, &c., and of their new arrangements, of which carbonic acid is the most conspicuous. Sulphur, volatile alkali, and various traces of saline substances, have been detected, in small quantities, too minute to deserve particular notice.

When it is considered, that the ultimate principles, and elements, of animals, and vegetables, resemble each other so closely, viz., that carbon, hydrogen, oxygen, and nitrogen, are the bases of the former; and, that the three first elements belong, equally to vegetables—the presence of nitrogen constituting the most striking peculiarity of animal matter, compared with vegetable—our surprize will cease at the slight difference traceable in the exhalations, that arise from their decomposition. That these products are of the highest importance, by the changes they occasion in the condition of the atmospheric air, cannot be doubted—it is evident, that in a greater or less degree, they diminish the salubrity of the air, from their known deleterious properties; thus rendering it injurious, if not

fatal, to the powers of life; to which, it may truly be said, they are directly opposed. Two exceptions may here be stated, viz., volatile alkali, and lime—both being direct anti-putrefactives.

It will, however, be sufficient to point out those which are the most destructive—these are carbonic acid, nitrogen, and sulphuretted hydrogen—the former, it has already been shewn, is unrespirable—it destroys flame—and is fatal to animals—and, when it predominates in crowded apartments, and badly ventilated rooms, it occasions difficulty of breathing, giddiness, and faintness; and if oxygen be not restored to purify the air, death will ensue;—no dis-infectants, without ventilation, being competent to effect this change;—the nitrogen, and its combinations, are all, more or less, injurious—this component part of the atmosphere, it has been ascertained, is destructive of animal life:—the last product of animal decomposition arises from the union of sulphur with *hydrogen*—hydrogen being a *component part of water*, and an *active agent in the process of putrefaction*:—this gas has a peculiarly nauseous, and fetid odour—it extinguishes flame; when respired proves fatal,—and is always deleterious, even when diluted with air.

These chemical agencies, when combined with the constituent principles of the air, become subject to the influences of those properties, which have been termed mechanical; these occult qualities, in combination with heat, constitute the barometrical, and thermometrical conditions of the atmospheric air;—the specific gravity, and temperature, of this, and of other gases, have been discovered, with much accuracy through the researches of chemists.—*Vide Brande, vol. 1, p. 379.*

Having cursorily, and, I fear, imperfectly, examined the results of those mutual actions, and processes, in which the sensible objects, and the material parts of our own, and of other bodies, to which they bear direct relation, are concerned; which under a given assemblage, and combination of circumstances, produce a sequence of associated phenomena, and appearances, unitedly, tending to effect results of the greatest consequence to the health, and life of man—it was considered the most intelligible mode of proceeding, (and one that would facilitate an insight into the qualities of these agencies,) to pass in review the processes, and results, in their connected, and successional course; previously to our contemplating the laws, and provisions, under which they act, in all circumstances, and contingencies, to which they might be exposed, in the course of nature.

The facts, and observations, which have been brought forward for consideration, may admit of the following conclusions:—

1st. That atmospheric air is equally necessary for animals, and vegetables—that it consists of two elementary substances—that its natural condition, and equilibrium are, principally, supported, by the reciprocal operations of these agencies—the latter purifying, what the former contaminate—that the nature of carbonic acid is deleterious—and that the other products of putrefaction and of fermentation, are injurious, being



unfit for respiration, and for the other purposes of life—that the principal, ultimate elements of animal, and vegetable matter, are closely analogous—and that their *gaseous products*, during decomposition, bear an equal resemblance—that these *combinations* are *negatively*, not *specifically*, *deleterious*—these being *unrespirable*;—hence, by *not supporting respiration*, they are *incapable of affording “the breath of life.”*

2ndly. That the virulent essence or seed, bears the same relation to the human frame—its producing medium—and to the atmosphere; as ova and seeds do to their respective animals, and vegetables, and to their natural elements.—This proposition has been grounded upon the evidence deduced from analogy.

3dly. That morbid poisons are capable of preserving their primary specific qualities undestroyed, is confirmed, by their obstinate retention of the same properties through ages, beyond human memory, and in periods, commensurate with our own experience.

4thly. That they are controlled by fixed laws, is further attested, if not verified, by the following facts:—1st, by their *resisting the chemical, and deleterious influence of carbonic acid*, (which is *not a component part* of atmospheric air), with which, (from the universality, and constancy, of its presence, upon the external, and internal, surfaces of the animal frame, and from its uninterrupted evolution, during life,) the pestilential effluvia must, at all times, become blended, before infection could be actually accomplished—for, if it were liable to suffer mutation from the *carbonic acid*, (*its presence being perpetual*) those specific diseases, that depended upon their dissemination, through the medium of the air, would, of necessity, have been extinct—the virus of each becoming dis-qualified for its natural mode of communication; 2ndly, by the more *rapid* progress of infection, and the more *frequent occurrence* of disease, when the air is most *contaminated by human effluvia, or paludal exhalations*—when the pestilential constitution of the air is most intense, and most concentrated;—under these favouring circumstances, epidemics, and endemics, are found, by experience, to be more prevalent and extensive;—hence, by a train of occult, and inexplicable circumstances, corruption becomes the conductor of corruption, and “infects unseen.”

These distinct divisions of disease, are known to preserve their identical character, uniformly, and invariably, under their relative circumstances—thus Typhus is found in the crowded, and contaminated apartments of the poor; while an Intermittent is discovered among the paludal, the vegetable, and the earthy exhalations of nature; the former disseminates its pestilential effluvia indiscriminately to others—while the disordered action, excited by the latter, centres in the subject, of its specific influence. Typhus may exist in every division of the known world,—intermittents preserve their identity, with equal strictness, whether they occur in the fens of Essex, or in the Mysore of India;—whether in the Maremma of Italy, or near the Pontine Marsh;—in the Island of Walcheren, or in the



Campagna di Roma;—the varieties observable in their types depend upon the conditions, and peculiarities of the human frame, and upon atmospheric influences,† and not upon any mutation of the primary qualities of the virus of the several morbid poisons, as the last cases of Typhus Fever and Ague, manifest the same specific characters, which they displayed at the commencement of their epidemical and endemical course.

These interesting, and instructive facts, imply a provision for contingencies; for, in the words of Mr. Herschel, it is this provision, *à priori*, this contemplation of possible occurrences and predisposal of what shall happen, that impresses us with the notion of a *law* and a *cause*.

The plain inferences to be drawn from all that has been adduced relating to “atmospheric influence,” seem to resolve themselves into these data;—that certain conditions of the air render the human frame more or less susceptible of pestilential effluvia, and aid in the dissemination of morbid poisons. In this sense, an endemical constitution of the air may be said to exist as well as an epidemical. The ultimate elements, the “*veræ causæ*” of morbid poisons—of these specific and deleterious agents,—are, as yet, “residual phenomena,”—having hitherto eluded detection.

Although the chief motive, for introducing the foregoing analytical sketch, was for the purpose of illustrating the *relation*, that subsists between the virus of morbid poisons, and the atmosphere, as well as, for elucidating *that*, which obtains between the same element, and animals and vegetables; yet there remains one great physical question to be disposed of, (the ultimate solution of which may be found materially to rely upon those elementary substances, and their various combinations, which have furnished the principal data of the preceding reflections,) viz., how far those agents, that constitute the adventitious and contaminating conditions of the atmospheric air, possess the power of creating, or generating, any morbid entity, endowed with the property of specific excitation; which, by inducing specific action in the human frame, produces a virus of its own kind.

Hitherto a variety of theories has been formed, to account for these curious phenomena; to which prolific source are referable those personal, and angry discussions, which are still going on between the contagionists and anti-contagionists, and between the advocates, and oppugners, of equivocal generation. All, however, must admit, that these subjects are beset with, apparently, insurmountable difficulties, and stand in need of further elucidation from experiment; for opinion can never settle a point that depends upon facts.

A rational account cannot be rendered of these mysterious, and occult

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\* See Dr. W. Macmichael on Malaria, p. 15.

† See Dr. W. Heberden on Increase and Decrease of Diseases, p. 68—95.

entities, without considering all the agents, with which they may be connected, and by which, they are liable to be influenced; as well as the secondary causes, to which they may be referable. As this subject has been treated at considerable length in the preceding pages, the reader is requested to turn to page 32: it will be sufficient, therefore, very cursorily, to remark, that occult as these phenomena are to the eye of reason, some approximation to the truth may be obtained, by a careful, and accurate examination of the laws by which they are controlled; and by comparing them with those visible agencies, which preserve their species by a vital process of generation.

Analogy plainly instructs us in the momentous fact, "that specific propagation, by whatever mode it is effected, throughout the whole range of the works of nature, implies a specific principle of production, indicating design and contrivance; and whenever either in plants, or animals, we are able to examine the subject, we find procreation from a primordial seed. This constancy and uniformity in species, even where the *rudiments* are invisible, is sufficient presumptive proof of a peculiar, and immutable essence; for these results could not ensue, without that vital principle or property, which was transmitted to them at their formation, had been secured to them by certain fixed laws."

To create is the exclusive prerogative of the Author of nature; to generate is the property of the creature, and of the created thing;—by means of the principle of vitality, these become capacitated for propagating their species by seeds and ova, and for being susceptible of the action of external agents, some of which, by possessing specific excitation, owe their re-production, and maintenance, to the animal function of secretion—while to receive, transmit, and to develop, are qualifications assigned to the properties and influences of the elements of nature.

As it is not my intention to extend these observations, yet it may not be unworthy of the reader's attention to learn, how clearly these points have been stated, in the oracles of Zoroaster, and which are peculiarly applicable in this place; as these Persian records are directly opposed to the materialism, and mythology, of the Egyptians.—*Vide Appendix, No. 20.*

"For natural works co-exist with the intellectual light  
Of the Father," &c.

"Beneath them lies the chief of immaterials.

"Principles, which have understood the intelligible works of the Father,

"Disclosed them in sensible works as in bodies:

"Being (as it were) the ferrymen betwixt the Father and matter,

"And producing manifest images of unmanifest things:

"And inscribing the unmanifest in the manifest frame of the world."

*See Ancient Fragments, J. P. Cory, Esq.—pp. 105, 109.*

No. 16. "But the contagion of Typhus Fever lies dormant sometimes, according to the testimony of Dr. Haygarth, seventy-two days; and Dr. Bancroft has even asserted that it may lurk in the system so long as five



or six months." In a note upon hydrophobia, the same writer observes, six weeks, or about forty days, is the most usual period. In a case which occurred a few months ago, in the Middlesex Hospital, &c., the interval was six weeks."—*See Dr. W. Macmichael, on Scarlet Fever, p. 75.*

"Even the effects of marsh-miasmata do not, in some instances, shew themselves for some months after the infection has been received." Sir A. Cooper illustrates this statement by a very marked case, and adds, "well, then, here was an example in which the seed of an intermittent had been sown more than two months before the symptoms were apparent."

"First, I must observe that there is a remarkable difference as to the time when the effects of morbid poisons begin to act; in some instances twelve months have been known to elapse after the insertion of the poison, before the symptoms appeared."—*Sir A. Cooper's Manuscript Lectures on Morbid Poisons.*

See Dr. Babington's account of a case in the Medical Researches, where he stated that the symptoms were not apparent until the three hundred and sixty-fourth day after the insertion of the poison of hydrophobia.

"A period from five to six weeks, taking the average of cases, occurs from the insertion of the poison, to the first intimation of the approaching disease"—and adds, in other instances the symptoms "have been protracted to months, and even to a year, and somewhat upwards."—*See Dr. Hamilton, on Hydrophobia, vol. i., p. 54.*

No. 17. *Mr. Hunter, see his Treatise on the Blood, p. 3.*—"No two different fevers can exist in the same constitution, at the same time," &c. "Let me illustrate this principle still further, by one of many cases which have come under my own observation. On Thursday, 16th of May, 1775, I inoculated a gentleman's child, and it was observed that I made pretty large punctures. On the Sunday following, viz., the 19th, he appeared to have received the infection, a small inflammation or redness appearing round each puncture, and a small tumour. On the 20th and 21st, the child was feverish; but I declared that it was not the variolous fever, as the inflammation had not at all advanced since the 19th. On the 22d, a considerable eruption appeared, which was evidently the measles, and the sores on the arms appeared to go back, becoming less inflamed. On the 23d, he was very full of the measles; but the punctures on the arms were in the same state as on the preceding day. On the 25th, the measles began to disappear. On the 26th and 27th, the punctures began again to look a little red. On the 29th, the inflammation increased, and there was a little matter formed. On the 30th, he was seized with fever. The small pox appeared at the regular time, went through its usual course, and terminated favourably."

See Adams on Morbid Poisons—Mr. C. Salt's Essay on ditto, p. 88.

"Richard Brooks, aged 18, was inoculated by Mr. Waschel, with fluid



from the miliary vesicles of measles, and with vaccine virus, Jan. 6th, 1800. On the 10th, there was some redness and elevation in both the inoculated places. Jan. 15, the redness round the part where the lymph of the measles was inserted, had disappeared, while the vaccine pock was vivid. Jan. 18th, the vaccine disease was over. Jan. 22d, he had a severe cough, sneezing, and watery eyes, with cold shiverings and fainting. Jan. 28, the measles appeared; his eyes were inflamed, and the lids swollen. Jan. 29, the efflorescence was diffused all over the surface of the body; frequent cough, and violent fever. Feb. 1st, efflorescence disappeared; cough and fever much abated. From that time he gradually recovered, and was dismissed in health on the 12th of February."

The law of morbid poisons, (which are different in their nature,) shews that they are frequently interrupted in their course, as is repeatedly shewn in experiments tried with small pox, and chicken pox, with small pox and measles, and also with cow pox, and each of the others. It was remarked by Dr. Woodville, that "if a person be inoculated to-day with cow pox, and three or four days afterwards with small pox; or to-day with small pox, and three or four days after with cow pox, the *two insertions*, though the last may remain smaller than the first, will run their usual local course."

No. 18. "Many animals are known to us as objects of alarm and terror, some are directly formidable by their strength and ferocity, as beasts of prey; others by their noxious properties, as venomous reptiles and insects," &c. Again, "animals are just the same now, as at any, even the remotest period of our acquaintance with them. The zoological descriptions of Aristotle, composed twenty-two centuries ago, apply in all points to the individuals of the present time; and every individual mention of animals, or allusion to their *characters and properties* in the writings of historians, poets, and fabulists, confirms their *identity of form and endowments*. Every work of art, such as statues, paintings, sculptures, and the actual relics in tombs, mummies, &c., all corroborate the proof." —*Lawrence's Physiological Lectures*, p. 242—*Cuvier's Researches*, 1 *Disc.* p. 80.

See Appendix, No. 16.

It has been said, "that events do not succeed each other at random but with a certain degree of order, regularity, and connection; some constantly, and, as we are apt to think, immutably—as the alternation of day and night, summer and winter—others contingently, &c. The knowledge that the former class of events *has* gone on, uninterruptedly, for ages beyond all memory, impresses us with a strong expectation that it will continue so in the same manner; and thus our notion of an *order of nature* is originated and confirmed, &c., every law is a provision for cases which *may* occur, and has relation to an infinite number of cases that never have occurred, and never will. Now, it is this provision, *à priori*, for contingen-

cies, this contemplation of possible occurrences, and pre-disposal of what shall happen, that impress us with the notion of a *law* and a *cause*."

Alluding to the elements, and other combinations, which chemistry has shewn to exist; the author continues to observe, "that no chemist can doubt. Among all the possible combinations of the fifty, or sixty elements, which chemistry shows to exist on the earth, it is likely, nay, almost certain, that *some* have never been formed; that some elements, in some proportions, and under some circumstances, have never yet been placed in relation with one another. Yet no chemist can doubt that it is *already fixed* what they will do when the case does occur. They will obey certain laws, of which we see nothing at present, but which must *be* already fixed, or they could not be laws. It is not a habit, or by trial, and failure, that they will learn what to do. When the contingency happens, there will be no hesitation, no consultation—their course will at once be decided, and will always be the same if it occur ever so often in succession, or in ever so many places at one and the same instant. This is the perfection of a law, that includes all possible contingencies, and ensures implicit obedience—and of this kind are the laws of nature."—*See Herschel*.

No. 19. See Appendix, No. 15.

No. 20. All adoration was paid to the sun and to the earth by the Egyptians under various titles.—*Vide Bryant on the Plagues of Egypt*, p. 143. "The sun, in consequence of it, was esteemed to be the soul of the world, and Diodorus Siculus mentions, that the ancient Egyptians supposed this luminary and the moon to rule all things by their influence; and that they were, through all ages, the chief deities, and the conservators of all things—and not only the conservators, but the creators. Hence it is that they esteemed the sun as the principal being in the universe, by whom all things were produced. Homer, who borrowed from Egypt, ascribed to the sun intellect, and universal perception," &c. "The Egyptians, Syrians, and other nations, esteemed themselves descendants of the sun"—"they worshipped him both as their sovereign and parent"—"they worshipped also the elements, particularly fire and water"—"they esteemed fire to be a living informed animal." "The true Egyptian name for fire seems to have been Phthas—an elementary deity—the divine intellect, by which all things were fashioned, &c.; but such was the reverence which they paid to them, that, in process of time, they forgot the hand by which all things were framed; and looked upon the immediate means, and support of life, as the primary efficient cause, to the exclusion of the real creator."

SANCHONIATHO'S COSMOGONY.—"He supposes that the beginning of all things was a dark and condensed windy air, &c., and of that wind from its embrace was begotten Môt; which some call Mud, others the pu-



refaction of a watery mixture ; and from this sprung all the seed of the creation, and the generation of the Universe.”—*Vide Ancient Fragments*, by T. P. Cory, p. 3.

No. 21. But the constitution of seeds is still more admirable than either their preservation, or their dispersion. In the body of the seed of every species of plant, or nearly of every one, provision is made for two grand purposes : first, for the safety of the *germ* ; secondly, for the temporary support of the future plant, &c. It is wonderful also, how long many kinds of seeds, by the help of their integuments, and perhaps of their soils, stand out against decay. A grain of mustard-seed has been known to lie in the earth for a hundred years ; and as soon as it had acquired a favourable situation, to shoot as vigorously, as if just gathered from the plant.—*Paley's Natural Theology*, vol. iii., pp. 247 and 8.

No. 22. *Herschel*, p. 76, sect. 66.—“ But in natural science, *cause* and *effect* are the ultimate relations we contemplate. To experience we refer as the only ground of all physical enquiry.” Sect. 83. “ Dismissing, then, as beyond our reach, the enquiry into causes, we must be content at present, to concentrate our attention on the laws which prevail among phenomena, and which seem to be their immediate results.” 170. “ In the study of nature we must not, therefore, be scrupulous as to *how* we reach to a knowledge of such general facts ; provided only we verify them carefully when once detected, we must be content to seize them wherever they are to be found.” 202. “ The mechanism of nature is for the most part either on too large or too small a scale to be immediately cognizable by our senses, and her agents in like manner elude direct observation, and become known to us only by their effects. It is in vain, therefore, we desire to become witnesses to the processes carried on with such means, and to be admitted into the secret recesses and laboratories where they are effected.” 204. “ Again, the agents employed by nature to act on material structures are invisible, and only to be traced by the effects they produce.”

“ In physiology, as in the physical sciences, we quickly reach the boundaries of our knowledge whenever we attempt to penetrate the first cause of the phenomena. The most we can accomplish is, to make gradual conquests from the territories of ignorance and doubt ; and to leave under their dominion those objects only which our reason has not reached, or is not able to reach. The great end of observation, and experiment, is to discover, among the various phenomena, those which are the most general. When these are well ascertained, they serve as principles, from which other facts may be deduced. The phenomena succeed each other, like the generation of men, in an order which we observe, but of which we can neither determine nor conceive the commencement. We follow the links of an endless chain ; and, by holding fast to it, we may



ascend from one link to another; but the point of suspension is not within the reach of our feeble power.”—*Lawrence's Lectures on Physiology*.

No. 23. “The most remarkable, and curious instance, of compensation, will be found in the seeds of the Misseltœ, which are endued with an adhesive quality, so tenacious, as to adhere to the bark of almost any tree; and observe what follows—a Misseltœ plant is produced—of no other plant do the roots refuse to shoot in the ground; of no other plant do the seeds possess this adhesive, generative quality, when applied to the bark of trees.”—*Paley's Natural Theology*.

With equal truth may it be said respecting poisons, none of which possess this parasitical property, excepting the morbid; of no other poison does the virus possess this peculiar exciting quality when applied to the human frame.

Other instances of this provision might be found, but I considered it sufficient for the purposes of illustration, to adduce this striking example from the vegetable kingdom.

If we turn our eyes to the pages of Zoology, equally striking instances will be found in animals; some of which, are more in point, than others; yet the same purposes are effected, though the means do not precisely agree. The first example I shall bring forward is the mode by which the continuance of the *æstrum equi*, or gadfly is effected. This fly, as if endowed with intelligence, (to use the language of a late distinguished writer) or instructed by experience, never deposits its eggs, but on those parts of the horse, to which that animal can apply its mouth, so that they may be swallowed. By this means, the larvæ are supported, and developed, until they are expelled in the spring, in order to undergo their metamorphosis into perfect flies.

The second, is an equally extraordinary instance of peculiar provision, by which the continuance of species of the ox fly (which, for the sake of argument, may be called the *Æstrum Vaccæ*) is produced: here the same kind of instinct is observable, for this insect deposits its eggs, within the pores of the skin, upon those parts of the animal's back, *that are farthest out of the reach* of its tongue, and least exposed to disturbance from alteration of posture, and most favourable, from the nature of its structure, for the support of the larvæ, during the winter; in the spring, a rapid growth takes place, announcing its presence, the termination of which is the escape of the larvæ, and their ultimate development into perfect flies.

The cuckoo species affords a case in point, though the peculiar provision may not be considered as striking—the birds of this tribe, to ensure the continuance of their species, *deposit their eggs in other birds' nests* (though they have been known to hatch their own).

The last example I shall adduce, is that of the Pipa, or Surinam toad, which excludes its eggs, like other animals of the same kind; yet

the young become afterwards lodged in separate cells on its back, which have no communication with the interior of the animal: in these they grow, although they, apparently, obtain no nourishment from them, being perfectly detached, and the cells themselves yielding no secretion. These phenomena, much as they excite our astonishment, still should be considered within the course of nature, as they constitute a part of one universal whole.

No. 24. See Dr. Willan, 4to, vol. i., p. 284, &c.

No. 25. Dr. Willan has quoted passages from ancient writers in illustration of the opinion in the text, viz., Aretæus and Aëtius.

An author of great celebrity, in describing the inflammation of the tonsils, has evidently made a distinction with the common inflamed sore throat, and the ulcerated; and says, "but when pestilential ulcers occupy the tonsils," &c.; and again, when giving an account of the Angina, and its two varieties, he distinctly states, "but some are liable to have fever, accompanied with *redness of the face and throat*, and others a swelling of the throat;" and adds, "that youth are seldom affected with the last species:" whence it may be inferred, that they were subject to the former.—See *Paul Aegineta, De Angina*.

No. 26. See Dr. Willan, 4to, vol. i., p. 286.

No. 27. Al-hemeka—"The word Hemka signifies Beet, the stain of which might warrant the employment of this term, with a prefix (according to the custom of the Arabians), to describe the scarlet rash."

No. 28. Dar Garrote, to strangle, also to choak.

*Garrotillo*, a quinzey in the throat; so called because it choaks a man, as if he were strangled. It was called the pestiferous sore-throat by Bonnetus, Tom. I., p. 479. Syrian Ulcers—ulcerated Angina, the sore-throat of youth, &c. &c.—See *Dr. Willan*. p. 296 to 300.

No. 29. See Dr. Willan—Dr. Withering—Reports on the Diseases in London, p. 341.

No. 30. See Dr. Willan.

No. 31. No symptom, occurring at the close of Scarlatina, marks the character of the complaint so strongly, as swelling of the feet.—See *Cullen, Withering, Sydenham, Morton, &c.*

No. 32. Dr. Willan observes, "that many patients died of the sore-throat in nine hours from the commencement of the fever." Such a mortality will not, now, excite wonder in those, who are informed, that



the Parisian Physicians attempted to cure this disease, by repeatedly scarifying under the chin, by bleeding in the jugular vein, and by extirpating the uvula, &c.

No. 33. See an interesting Note upon this subject; Dr. Willan, p. 322.

No. 34. The reader is again referred to Dr. Willan's list of copious authorities, and to his judicious and satisfactory observations upon every point that illustrates this paragraph.

No. 35. "Some persons, though this very rarely happens, have been infected with it more than once."—*Dr. Heberden's Comment.*, p. 27.

Sir Astley Cooper observes in his Lectures upon Morbid Poisons, "if the Scarlatina should happen a second time, the fever is much less than the first; the *inflammatory* symptoms, in such a case, are *mitigated*, and *much less severe*."

Dr. Binns says, "I have not, during the prevalence of Scarlatina this year, seen the fever and scarlet eruption occur twice in the same patient." Dr. Withering, "I never yet have seen an instance of the same person having Scarlet Fever twice, and I believe it to be as great an improbability as a repetition of the Small Pox." Rostein, "I have never heard of Scarlatina seizing any one more than once."

"That the Scarlet Fever, like Small Pox, is in some rare cases to be had twice, will not be denied, though the proportion of such instances which is assigned by Dr. Willan, is, perhaps, unusually small; for he asserts, that in 2000 patients he had never seen a repetition of the disease. It may, however, be safely affirmed, that Scarlet Fever does not occur twice, more frequently than the other contagions; consequently, no argument can be founded on such an anamoly."—*Dr. Macmichael, on Scarlet Fever*, p. 60.

No. 36. See Appendix, No. 32.

In the Scarlet Fever accompanied with sore throat, Physicians on the Continent, Dr. Willan observes, recommend bleeding from the arm, or when the head is much affected, from the jugular vein. Dr. Morton adopted the same practice in London; and it was formerly employed in the northern part of this Island.—*See Medical Essays*, 1733. Dr. Withering, Dr. Clarke, Dr. Sims, and Dr. Willan, unite in saying, that they never saw bleeding necessary in Scarlet Fever, or Scarlet Sore-throat, and that it invariably did harm.—See the observations of the latter upon this point, p. 351.—In 367 he adds, "If my countrymen have had more success in the treatment of Scarlatina, than Physicians on the Continent, I would ascribe it to the general disuse of *bleeding* and *purgatives*, during the last thirty or forty years, within which period gangrene, and



dropsy have been with us much less frequent occurrences than formerly." In malignant Scarlatina, Dr. Withering says, page 89, *bleeding* and *purging* are always hurtful. Dr. Fothergill, Dr. Willan states, was among the first to discourage this destructive practice.

No. 37. See Dr. Sims, p. 422 ; Dr. Willan, p. 366 ; Dr. Clarke, and Dr. Withering, all agree, that if bark and cordials were persisted in through the course of the disease, a recurrence of fever took place with great swelling and inflammation of the glands of the throat.

No. 38. See Dr. Currie's Medical Reports—Dr. Willan, p. 360—Dr. Stanger's Account of the Scarlatina, at the Foundling Hospital, in 1804—Dr. Macmichael's New View of Scarlet Fever, p. 88.

No. 39. See Historical Sketch, and p. 59.

"We have no specific remedy for the Small-pox, nor can we readily have any for a disease which cures itself."—*Hunter on the Blood*, &c., 4to., p. 264.

No. 40. See Appendix, No. 35.

"Epidemics do not fall upon the multitude in this simultaneous manner—on the contrary, they select their objects at intervals, one after another, according to previous habit and predispositions ; although the cause may be universally acting at the time."—*Dr. Hancock*, p. 159.

Dr. Binns in his account of Scarlatina at Ackworth School, observes, "It began in a boy from Sheffield, who had been with us a considerable time, and then gradually spread over the School."

Dr. Russell, p. 49, says—"In the beginning, the same circumstance is observable in the Plague, those frequenting the sick often escape unhurt, or one only out of several is infected."

Dr. Hancock, p. 153, speaking of the Plague, says—"because only one in a family of many members is perhaps liable to be affected."

The same writer, in his elaborate and interesting work on the Plague, observes, the very long interval which took place between the first case in London will now be recollected.

"And if all things go on well, the distemper abates very fast after the seventh day."—*Dr. Heberden*, p. 19.

"On the fifth day, 'Scarlatina' begins to decline ; on the sixth day, its appearance is very indistinct, and it is wholly gone before the end of the seventh."—*Dr. Willan*, p. 256.

No. 41. *Dr. Willan*, p. 378. "There is not any certain preservative from the contagion of the Scarlatina, for persons within its influence ; and in page 388, alluding to separation and fumigation, observes, "all the precautions, above specified, should be observed on the appearance of the simple Scarlatina, as well as when our attention is called to the more dan-

gerous forms of the distemper." From preceding statements he adds, "it follows that the slightest case of Scarlet Fever, occurring in a large family or school, where no preventive care is exercised, may presently produce in some the Scarlatina Anginosa, (with sore-throat,) in others the ulcerated sore-throat, and in others the gangrenous sore-throat. Influenced by a consideration of these circumstances, ought we not to employ all the means in our power, and especially such as have been found successful against other contagions."

The Reports of the Institution for the Cure and Prevention of Contagious Fevers in the Metropolis, shew us how much may be accomplished by a persevering attention to the subject. This Society, by removing persons first affected to a convenient house, and by ventilating, cleansing, and fumigating the apartment they had occupied, their apparel, bedding, furniture, &c., was enabled within three years, nearly to suppress the Typhus or malignant Fever, in several adjoining parishes, where it had before annually raged with great mortality among the labouring poor. Some restraints imposed with regard to the sources of contagion, and enforced by authority, might also prevent the diffusion of the Scarlet Fever in London, in other cities, in our sea-ports, and considerable manufacturing towns, from which it is often conveyed, in various directions, through the country; and adds, it is therefore, reasonable to conclude, that similar efforts might finally extirpate the Scarlatina, &c.

Dr. Binns, whose extensive experience in Scarlatina, renders his authority important; observes, "I would recommend in large schools, that the sick, and their attendants, or visitors, should be precluded from any communication with the rest of the family." He adopted a fever house, &c.

See an Address upon the subject of the advantages of Fever Houses, by Dr. R. Fenwick. He remarks, "If, on the contrary, the persons first attacked by fever, are received at a sufficiently early period of the disease, into clean well ventilated apartments, and due attention is paid to cleansing, and purifying, their houses, furniture, and cloathing, the progress of the contagion is checked, and the fatality diminished," &c.

"Nevertheless, the rule will, I believe, invariably apply; and it seems to have been practised with success in the American cities, wherever threatnings of pestilence make their appearance, to separate individuals and communities as far apart as possible, so as to prevent the accumulating force of animal effluvia, which large assemblages, in unfavourable seasons and situations, are known to produce."—*Dr. Hancock*, p. 169.

See Dr. Macmichael's New View of the Infection of Scarlet Fever, &c., p. 30. This writer has recommended another plan to be adopted when Scarlet Fever prevails, as an Epidemic.

"Parents considering the Measles as a disease almost inevitable, have wisely chosen to expose their children to the contagion, at such auspicious times;" (viz. when they appear epidemically under a mild form)



“so that the disorder may be once well over, and all further anxiety at an end. It will be my present purpose to prove that the same practice should be followed as to Scarlet Fever, a name that sounds so fearfully in the ears of mothers.”

No. 42. The chloride of lime and soda, formerly called the oxymuriate of lime and soda, and by the French chemists, chlorure (English, chloruret), is the result of a union of chlorine with the oxides of lime and soda. Chlorine is susceptible of entering into combination with almost all the simple substances, and with some compound bodies. The distinguishing properties of the chlorides is, that they retain several of the properties of chlorine, and possess the nature of alkalis. These preparations are very liable to be confounded with the chlorates, which terms have been assigned to those salts, that result from the combination of chloric acid with salifiable bases. Thus chlorates differ in their chemical composition and properties, neither possessing the dis-infecting, or the medicinal qualities, which belong to the chlorides.

Mr. Alcock observes, “the term *chloruret of oxide of sodium* has also been retained in preference to that of *chloruret of soda*, to prevent mistake by confounding the chloruret of soda with the chloruret of *sodium*, which, like the chlorates, does not possess the same valuable properties as the chloruret of the oxide of sodium. The *chloruret or chloride of sodium* is the residuum of common salt, after it has been exposed to a heat approaching to redness.”

See Mr. Alcock's Essay on the chlorurets of sodium and of lime, Intro., p. 4.

“The chloruret of the oxide of sodium may also be designated by the terms chloruret of soda, and chloride of soda.”

“The chloruret of lime, formerly called the oxymuriate of lime, has also been termed in this country the *chloride of lime*.”

“Hence the term *chloride* is used as synonymous with chloruret.”

“Chlorates.—The name *chlorates* is given to those salts which result from the combination of *chloric acid*, with salifiable bases.”

“The *chlorates* do not possess the dis-infecting or medicinal properties which belong to the chlorides.”

“Chlorine is susceptible of combining with almost all the simple substances, and with some compound bodies; these are the combinations called chlorurets” (chlorides.)

“Sodium is obtained, by a chemical process, from soda. When sodium is heated with chlorine, chloride of sodium is produced. This substance does not alter by exposure to air.”—*Mr Brande's Chemistry*.

Brande, vol. II., p. 62.—“Chloride of calcium or lime is produced by heating lime in chlorine, in which case oxygen is evolved. It consists of 19 lime  $\times$  33.5 chlorine. This compound has a strong attraction for water, it deliquesces when exposed to the air. *Chloride of lime* absorbs



ammoniacal gases in considerable quantities."—See *Mr. Faraday's Journal of Science*.

Chloride of lime in solution, when exposed to the air in a room, is gradually decomposed; one part of the lime combines with the carbonic acid, whilst the chlorine is disengaged. The attraction of chlorine for sodium and lime, is greater than that of oxygen—consequently, when either is heated in chlorine, oxygen is evolved, and a chloride formed. Soda and lime produce alkaline oxides, when united with oxygen.

But the physical and chemical properties of the chlorides are so extremely various, that, any person, desirous of further information upon them, should consult those works professedly written upon this subject. Mr. Brände's *Manual of Chemistry* will be found to contain a clear and comprehensive account of these chemical agents.

No. 43. M. Labarraque observes, "We shall be certain of destroying the miasmata which are developed in places inhabited by persons affected with disease, if we are careful to sprinkle the rooms with one of the two liquid chlorurets, much diluted with pure water, or even by leaving it exposed on a plate in the sick room; the chloruret must be renewed morning and evening, or when it shall have *lost its peculiar odorous character*."

No. 44. Upon the general management, and precaution required in combination with the dis-infecting process, he remarks, "Although the pestilential effluvia diffused in the *atmosphere (surrounding the sick)* be capable of *immediate correction*, yet unless the cause be removed, the regeneration of similar effluvia is not prevented. Hence, therefore, the most rigid attention to *cleanliness*, and appropriate *ventilation*, is essential to the welfare of the sick; although the chlorurets *may destroy the putrid miasmata*, they cannot furnish that supply of pure air, without which, health cannot be sustained, nor disease be successfully treated."—*Mr Alcock's Essay*, p. 64.

No. 45. The instructions of M. Labarraque respecting the mode of using the chloruret (chloride) of lime, recite "that repeated experiments have shewn that the chloruret of lime dissolved in water has the property of dis-infecting the air, and of sensibly retarding putrefaction."—See *Mr. Alcock's Essay*, p. 9.

"Although both the chlorurets possess great powers as dis-infectants, M. Labarraque has pointed out the circumstances under which the one should obtain a preference, whilst the other is liable to some disadvantage. Of the use of the chloruret of lime as a dis-infectant, compared with the chloruret of oxide of sodium, he observes, that this process of dis-infection, has seemed to establish a preference in favour of the chloruret of lime over the chloride of soda. These two chlorurets are gene-

rally proper to arrest putrefaction; but nevertheless they have not the same secondary properties. He explains, in the act of dis-infection of a putrid animal substance, the chloruret passes into a state of hydro-chlorate; and the hydro-chlorate of lime having the property of absorbing humidity from the air, fixes it upon the dis-infected body. Now one of the conditions of putrefaction being humidity, it follows, that once the dis-infection is performed, the chloruret, after a longer, or shorter, time, according to its quantity, has changed its state, and furnishes one of the conditions, fit to reproduce the putrefactive one. The chloruret of the oxide of sodium, on the contrary, in passing into the state of hydro-chlorate, gives place to the formation of a very dry salt, which acts as a preservative by coagulating the principle which commences putrefaction. This is what he calls a secondary principle.

Thus the chloruret of oxide of sodium will suit whenever we wish to dis-infect a body, and prevent the renewal of putrefaction; it will be fitted, above all, for the applications to ill conditioned wounds, &c.

While the chloride of lime seems better calculated for dis-infecting the atmosphere, impregnated with human, or noxious effluvia, thus constituting the more preferable application in every case of morbid infection.

“Notwithstanding the chloruret of oxide of sodium is generally to be preferred in its external application to the living body (as a surgical application, as well as for internal use); yet it will be found that the chloruret of lime may also be occasionally employed with advantage.”—*Alcock's Essay*, p. 66.

As the chloride of lime, as an atmospheric dis-infectant, becomes a hydro-chlorate, from its power of absorbing humidity from the air, and as the chlorates do not possess in so eminent a degree the dis-infecting and medicinal properties of the chlorides, it hence becomes necessary to repeat, after short intervals, the ablutions and sprinklings with the solution of the oxide of lime, more especially.

M. Labarraque adds, “the chloruret of lime serves for the dis-infection of amphitheatres, of sick wards, and of all places rendered unhealthy by the presence of putrified animal matter.”

No. 46. Mr. Alcock, p. 56—Dr. Roberts, in his *Guide Sanitaire*, p. 793, 1826, observes, “that the experiments recently made by M. Lisfranc, in Paris, prove that the air of wards, where small pox patients are confined, no longer communicates the disease, whilst daily sprinklings with solutions of chlorurets are employed.”

The same writer informs us, in p. 58, “that last year, M. Labarraque communicated personally to him, that the infection arising from measles, which had occurred in a boarding school, had been perfectly arrested, without the removal of any of the pupils; this security from infection having been effected by the use of the chlorurets.”

The reader will observe, that greater success has attended the employ-



ment of these dis-infectants in France, than in Russia, from the following statements, extracted from Sir Wm. Crichton's Report on Cholera:—  
 "Fumigations, made with chlorine, were generally employed as means of dis-infection, but experience does not justify us in speaking positively as to their efficacy."

Dr. Albers, who was sent to Moscow by the Prussian government, states, in his report, "that fumigation and chlorine were fully tried, but proved perfectly unavailing; while the latter, if used to excess, frequently appeared to be injurious." "At the time that the Cholera Hospital was filled with clouds of chlorine, then it was that the greatest number of the attendants was attacked;" and adds, "that the number greatly diminished, when free ventilation alone was had recourse to."

See p. 88, and Appendix, No. 44.

No. 47. See Dr. Alcock's Essay, p. 54.

The efficacy of acid fumigations, still more decidedly those by chlorine has been sufficiently established. The former are disagreeable in sick rooms, and inhabited wards; whilst the irritating properties of chlorine, in its gaseous state, upon the organs of respiration, preclude its adoption in inhabited places. Again, the chlorurets of lime and soda, however, possess the beneficial properties of the chlorine in destroying putrescent and infectious effluvia, without its noxious and irritating qualities, &c.

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The advantages which have been thus derived from a knowledge of the usual order of nature, when we are incapable of modifying or annihilating it, is placed in the most striking point of view by the following illustrative examples, selected from Mr. Herschel's chapter on the advantage of physical science, and its application to the practical purposes of life, and its influence upon the well-being of society:—

"In this view we might instance, too, the *conductor*, which in countries where thunder-storms are more frequent and violent than in our own, and at sea (where they are attended with peculiar danger, both from the greater probability of accident, and its more terrible consequences when it does occur), forms a most real and efficient preservative against the effects of lightning:—the *Safety Lamp*, which enables us to walk with light and security while surrounded with an atmosphere more explosive than gun-powder:—the *Life-boat*, which cannot be sunk, and which offers relief in circumstances of all others the most distressing to humanity:—masks of magnetized steel wire are now constructed and adapted to the faces of those workmen who point the needles employed in the needle manufactories. By these the air is not merely *strained* but *searched* in its passage through them, and each obnoxious atom arrested and removed."



No. 48. Again, it must be carefully remarked that, as many of these diseases appear in the same year, some one or other of them rules over the rest, and thus, they prevail by turns, according as each is favoured by the disposition of the year, and the sensible qualities of the air, &c.—*Sydenham on Epidemic Diseases*, p. 13, vol. 1st.

Alpinus says, that when the Plague ceases in Egypt, epidemical diseases begin to shew themselves, which never appeared during the Plague.—*Dr. Hancock*, p. 181.

Eaton, in his survey of the Turkish empire, says, “That when the cities of Syria are afflicted with the Plague, and it begins to decline, Epidemic Fevers generally succeed, which prove nearly as fatal.”

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As the cry of Plague has ceased from out the land, and those gloomy forebodings of the future are no longer heard in our streets, (though the Pestilence that raised our fears is yet in actual progress;) it may not be deemed unseasonable, or unprofitable, to recall the attention of the public, to a sober apprehension of the evil, that may still await us, by reminding them of those facts, which were officially announced for individual as well as for general information, and which claim the consideration of every one, who may occasionally make these topics the subject of his serious meditation.

While these sheets are preparing for the press, accounts have reached this country, containing the melancholy tidings, that the pestilence, (which during the course of the last and the present year has desolated many parts of the Russian territory,) has broken out with undiminished fury and activity in several places within the Hungarian States. That the storm, which

has been lowering in the East, has not yet dispersed, receives additional confirmation from the same source, which shews that Constantinople is now suffering under the scourge of this Pestilence, and that it has reached the Russian and Austrian capitals :—it affords, however, some consolation, amidst this spread of pestilence, to be informed, that in certain sea-ports in the Baltic, the disease is pursuing a less destructive course, than characterized its earlier appearances ; although there are at present, no grounds for anticipating its speedy termination.

With these facts before our eyes, and living in times when such dangers prevail ;—although we ourselves have hitherto been exempt from their dominion ; though we have not yet been stricken—it must be manifest to all, that there is the possibility (in defiance of all our preventive means,) that this destructive disorder may be brought into this country. I repeat, living amidst such dangers, it becomes a paramount duty to exercise the strictest vigilance, and to enforce every precautionary measure, that common prudence, and forethought can suggest, and such as experience recommends : these means have saved other nations, in the time of danger, from a foreign pestilence, and may ultimately shield us from a similar visitation.

Considering the security into which this nation has been lulled ; a security, which could only be justifiable upon the positive assurance, that the apprehended evil was removed, (for, however it might have been felt, and feared, all must agree in thinking, that it has been quickly forgotten,) it may be worthy of remark



in this place, and may be introduced as a seasonable precaution, that the doctrine, which inculcates the belief, that the virus of an infectious epidemic, is weakest at the decline of its pestilential course ; qualified, only for transmitting a modified, and mild disease—has not received that support, and sanction from facts, which warrant its adoption as a practical principle ; experience having hitherto distinctly, and repeatedly shewn, that the virulent essence preserves its primary quality un-neutralized, and unchanged throughout each stage of its course ; that it has equal power to infect at the conclusion, as at the commencement, of its career ; that an imported pestilence displays throughout, its specific qualities, characters, and forms, uninfluenced by any varieties of the disease, from which it had been derived ; for, at whatever period of an epidemic, such infection might have been produced, the morbid sample is always found to preserve its identity : we may, therefore, from the stream judge of the fountain, and vice versâ. It will be seen, how highly reprehensible it would be in any people, should a diminution of pestilence occur in a country, with which they held commercial intercourse, to suspend, or relinquish, their Quarantine Laws, upon so fallacious, and flimsy a pretence ; for, as long as there remains one case of infection, pestilence may be rekindled. It should always be borne in mind, that in dealing with an infectious epidemic ; whether it be *the Plague*, or any other pestilential malady ; we are encountering a positive evil, that relies upon the *quality*, not upon the quantity, of its malignancy ; which exhibits, like the chameleon, (that assumes the



colour of those things to which it is applied) every gradation of shade, every form of character, during its course, from the simplest to the most noisome; that its approaches are stealthy, and subtle; though its attacks are sudden, and, often deadly. I am fully aware, that there are some very respectable writers, who entertain a different view of this subject, to that, which has just been stated; who believe that the quality of the virus strengthens with its growth, and weakens as it declines; thus having reached its acme, it gradually becomes extinct from exhaustion.

As the question that concerns the public, is one, upon which their judgment is to be exercised, and is of a nature that, in an especial manner, involves matters, not of mere speculation, but of facts;—I shall avoid canvassing the sentiments of others, upon the admission, or rejection, of the particular point now before us; and shall proceed to recall the attention of my readers to that official report, which has been drawn up with a care, perspicuity, and fidelity, worthy of our unreserved confidence.

In accomplishing this object, I shall not indulge in any introduction or admixture of my own opinions, that the public may exercise their own unbiassed judgment upon the data before them;—for opinion can never settle the long-contested question, between the contagionists and anti-contagionists;—facts are alone calculated to furnish materials for the solution of this difficulty, by affording the only grounds from which a sound conclusion can be drawn.

These facts, it will be seen, while they instruct us, in the general laws of pestilential fevers, point out

the advantages to be obtained by the prompt and judicious employment of Quarantine Laws, and of other preventive measures:—niceties of distinction observable in their courses, appearances, and sensible qualities, together with their treatment, fall exclusively within the province of medical science.

As strenuous and persevering efforts are perpetually made, through the medium of the daily press, by ignorant and interested persons (not meaning to implicate the members of the medical profession) to misrepresent circumstances, for the purpose of inducing the public to consider *this Eastern Pestilence* as an *Endemical Cholera*,—an *un-infectious malady*,—it becomes the more obligatory, that reference should be made to this verified document, as the standard, by which its morbid nature ought to be tried.

There is a stronger necessity for such an appeal being made to facts, when it is considered, that at no very distant period, the evil, under contemplation, may possibly come home to ourselves. Laying aside opinion, the first and real object of our solicitude should be, when any pestilential visitation threatens, to ascertain under what circumstances, the disease has happened; whether it has uniformly and invariably recurred under the same—whether, in short, it has been reproduced—whether it has been transferable from the infected to the uninfected, and if it be transportable by means of articles of dress and merchandise,—and, lastly, will it always happen again; to use the language of Mr. Herschel, if those circumstances, so far as we have been able to collect them, co-exist.



Should these interrogatories meet with a satisfactory answer, from the facts that can be produced, it may safely be concluded, that we have attained such data as can become the only useful grounds in enquiries of this nature,—from their happening uniformly, and invariably, under the same circumstances. It may here be stated, as an acknowledged axiom in the laws of infectious epidemics, and which consequently becomes the basis of our arguing upon these points, that if these facts can be verified, they may be received as constituting a scientific test of the nature of any pestilential disease.

By resting on arguments, founded upon the broad basis of these data, which cannot well be contested, and which have been generally recognised, we may safely form our definitive conclusion. It has been laid down as a general rule for guiding, and facilitating, our enquiries for an immediate producing cause, by an authority as yet undisputed, that we should not deny its existence, though it may not be apparent how such a cause can produce the effect, or even though it may be difficult to conceive its existence under the circumstances of the case ;—in such cases, we should rather appeal to experience, when possible, than decide *a priori* against the cause, and try whether it cannot be made apparent.

My only motive, in offering these suggestions, is a deep and settled conviction, resulting from experience, that with very few, if any, exceptions, every disorder that is liable to be communicated from the diseased to the healthy, through the medium of the air, may have its virus transported by articles of

merchandise, and by inanimate substances. I have, therefore, preferred appealing to facts, rather than to opinions, from which we can only glean the important lessons of truth. The warning voice of history, and the experience of our own time, inculcate the same lesson. Taking these as our grounds, and guides, on all occasions, when an epidemic becomes the object of research, we may less frequently be subject to err in our physical enquiries, or to be exposed to illusions of sense, which may lead to the grossest errors in practical decisions.

The following extracts have been transcribed from the copies of information communicated to our Government, relating to the nature of the pestilential epidemic prevailing in the eastern part of Europe; and to the precautions recommended, to prevent the introduction of such diseases into this country.—  
Printed by order of the House of Commons, 27th June, 1831 :—

“ Our knowledge of the symptoms of the disease, called Cholera Morbus in Russia, is derived entirely from a report drawn up by Sir W. Crichton, at St. Petersburg.

The remarkable facts attending its progress, and manner of extension, over the vast tract of country in which it has successively appeared, are as follows :—It showed itself in Astracan, near the mouth of the Wolga, on the 20th of July, 1830, immediately after the arrival of a vessel there from the port of Bakon, on the western coast of the Caspian sea; *on board which vessel, during the passage, eight men had died of the disease.* From Astracan, it spread itself in an eastern direction to Gourieff, and far up the course of the river Owrah; *and at the same time proceeded northward, in a course following strictly the great line of river communication of the Wolga; affecting successively all the principal towns on each bank of the river, as far as to the north of Yaraslov, and at dates corresponding with the ordinary rate of the navigation up this stream.* The earliest deaths at each place usually occurred among the boatmen employed in the navigation.

It is an important fact, that while thus ascending the course of the



Volga in a north direction, it was contemporaneously conveyed down the course of the Don in a south-west direction,\* to the sea of Azof, and to the coast of the Black Sea, and details are given, warranting the belief, that it was carried by personal intercourse across the neck of land which separates these two great lines of water communication. The disease appeared at Moscow in the first or second week of October, alleged to have been brought thither from Saratoff, an infected town on the Volga. At Moscow, it prevailed during the coldest months, having first appeared in the south part of the Russian dominions during the hottest season of the year. Quarantine was established on the road from Moscow to St. Petersburg. Upon this road the disease has never extended; but on another line of approach to St. Petersburg from Saratoff, where no quarantine was established, the disease advanced as far as Tikhvin, within 160 miles of Petersburg, where it appears also to have been arrested by quarantine.

It is important to mention here, that the Moravian colony of Sarepta, on the right bank of the Volga, several German colonies in the Government of Saratoo, around which the disease raged with great severity, and the school of military cadets at Moscow, were exempted altogether from the disease; strict precautions having been used in each of these several instances to prohibit all intercourse with the surrounding population.

The mode of ingress of the disease into Podolia and Volhynia is not equally certain; but it appears to have followed the great lines of communication between the southern parts of Russia, and those provinces, and to have accompanied the march of the armies in this direction.

The disease appeared very early in May on the road between Posen and Warsaw, and in the army of the Grand Duke Michael; subsequently at Praga and Warsaw, and in the Polish armies. A report, drawn up by a board of health of Warsaw, and transmitted to the French Government, and thence to the English Government, gives a statement of the numbers infected during seven days in the Hospitals of Warsaw and its neighbourhood.

The latest accounts we have before us are those regarding the extension of the disease to the sea-ports of Riga and Dantzick, on the Baltic, and the great mortality which occurred in the former of these places.

*From the progress of the disease, uninfluenced by latitude, through various districts in the Russian empire, following gradually the courses of great rivers and roads, in other words, the general lines of traffic, and communication; and from the fact that different towns, situated in its route, were exempted*

\* Compare the following passage, extracted from Gibbon's *Decline and Fall of the Roman Empire*, vol. vii., p. 418.

"*Plague, its Origin and Nature*, A. D. 542. The fatal disease which depopulated the earth in the time of Justinian and his successors, first appeared in the neighbourhood of Pelusium, between the Serbonian bog and the eastern channel of the Nile. From thence tracing, as it were, a double path, it spread to the east, over Syria, Persia, and the Indies, and penetrated to the west, along the coast of Africa, and over the continent of Europe. In the spring of the second year, Constantinople, during three or four months, was visited by the pestilence."

*from its visitations, by establishing a system of non-intercourse, we are of opinion that the disease called cholera morbus in Russia, is of an infectious nature.*

We have no evidence before us sufficient to decide whether this disease be communicable by merchandise, or not; there are some statements which appeared to support the latter opinion, but they are *neither numerous nor distinct enough to convince us that this disease does not, and will not, observe the laws which regulate other infectious disorders, &c.*, we can give no other opinion with respect to the transmission of the disease by merchandise than that we think the safety of the community will best be consulted by submitting merchandise to the usual regulations of quarantine, &c.

The facts, which the preceding extracts afford, speak so plainly, that all comment is unnecessary. The evidence they afford is equally strong, and unequivocal, and must, with every unprejudiced mind, set at rest the question of infection, as regards the disease called Cholera Morbus: these impress upon us, in language not to be mistaken, and which deserves not to be forgotten, the value of those salutary precautions, to which the nations and people, who have employed them, have been indebted for their safety.

That *this disease is a Plague*,\* cannot well be doubted; and it is equally manifest, that the precau-

\* As the disease, under consideration, does not resemble, in its characteristic symptoms, Dysentery, or any of the acute attacks, to which the bowels are generally subject, the following extracts may not be unworthy the attention of the reader; especially, as there will be found so close an affinity between the most formidable and deadly effects of the eastern Cholera Morbus, and those of the Plague, described in the passages selected:—

1 Samuel, c. v. v. 6—The Philistines smitten with a Plague, &c., “And He destroyed them, and smote them with emerods, even Ashdod and the coasts thereof.” The emerod has been considered a sudden and violent disease in the bowels, which occasioned great pain and torture.

Bp. Hall says, in a note upon this disease, “How miserable was the estate of these Philistines. Every man was either sick or dead; those that were still living, through their extremity of pain, envied the dead; and the cry of their whole cities went up to heaven.”—*See Ostervald—Bp. Warburton—Bp. Wilson upon these Plagues*, “which were upon the Philistines for their idolatry.”



tions of the most severe quarantine ought to be established against it. Resting upon this conviction, our Government has hitherto exacted a rigid compliance with these restrictive laws ; and by persevering in the same preventive measures, there is a well-founded hope, that we may yet be preserved from the horrors of a foreign pestilence.

In taking a final leave of the reader, I may be permitted to address him in the following familiar language :—"if you have discovered any thing nearer the truth, than the positions which I have here advanced, have the candor to impart it : if not, unite with me in adopting them."

" Si quid novisti rectius istis,  
Candidus imperti ; si non, his utere mecum."

*Hor. VI., Epist. 1.*

Vide Bp. Hall—Pyle, and other authorities.—Its deadly nature is proved by v. 9, 11, 12—"For there was a deadly destruction throughout all the city, and the men that died not were smitten with the emerods." Again, e. vi., v. 4—"For one Plague was on you all;" v. 5—"Wherefore ye shall make images of your emerods, &c., that mar the land." Bp. Patrick, in a note upon this passage, observes, "this was also a custom among the ancient heathens, to consecrate to their gods such monuments of their deliverances, as represented the evils from which they were freed." Tavernier relates, that this is still practised amongst the Indians : he says, that when any pilgrim goes to a pagod for the cure of a disease, he brings the figure of the limb or part of the body which is affected, made either of gold, silver, or copper, according to his quality, which he offers to his god, and then begins to sing, as all others do, after they have offered.

A similar practice of hanging up figures of the limbs, or parts afflicted with disease, still prevails in churches of the Romish communion.

What was the shape of these emerods which were offered, has been the subject of considerable doubt. The prevailing opinion has been, that they were made in the shape of the part of the human body which was diseased.—*Pole's Syn. Crit.*

That the Egyptians worshipped many deities out of dread, and which they abhorred, we are assured, both from the examples of the Greeks and of the Romans, viz., the following, which they must have hated and despised :—Fatua, Vacuna, Cloacina, Mephitis ; by this last was signified filth in the abstract ; which had a temple at Cremona.—*See Bryant on the Egyptian Plagues, &c.*—*Lucian de Calumniæ non temere credendo*—*L. Gyraldus de Miscellaneis Deis*, p. 47.

## ERRATA AND OMISSIONS.



- Page 7, l. 20, *for* incommunicability, *read* communicability.  
8, l. 17, *for* generic, *read* special.  
13, l. 9, a note of interrogation after Searlatina?  
14, l. 3, *for* speculatists, *read* speculators.  
23, l. 3, *for* import, *read* meaning.  
58, l. 26, *for* Swieter, *read* Swieten.  
88, l. 7, *read* the Chloride of Lime has been considered a more  
powerful dis-infectant than that of Soda.  
96, l. 3, *for* course, *read* source.  
125, l. 15, *for* deviation, *read* derivation.  
142, l. 27, *for* develope, *read* develop.  
148, note 28, *for* quinzy, *read* quinsy.





